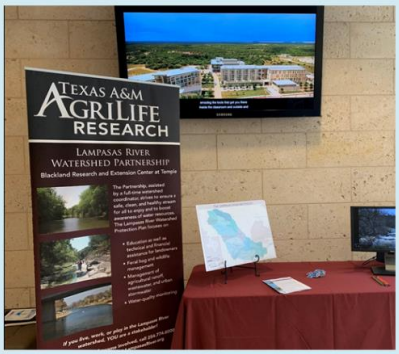

CONTINUED COORDINATING IMPLEMENTATION OF THE LAMPASAS RIVER WATERSHED PROTECTION PLAN

Final Report
TSSWCB Project # 17-05
Prepared by Texas A&M AgriLife Research

FUNDING PROVIDED THROUGH A CLEAN WATER ACT §319(h) NONPOINT SOURCE GRANT FROM THE TEXAS STATE SOIL AND WATER CONSERVATION BOARD AND THE U.S. ENVIRONMENTAL PROTECTION AGENCY

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LIST OF ACRONYMS

AgriLife Extension	Texas A&M AgriLife Extension Service
AgriLife Research	Texas A&M AgriLife Research
AU	Assessment Unit
BAEN	Texas A&M Biological and Agriculture Engineering
BMP	Best Management Practice
BRA	Brazos River Authority
cfu/100mL	Colony Forming Units per 100 milliliters
CWA	Clean Water Act
DT	District Technician
E. coli	*Escherichia coli*
EPA	Environmental Protection Agency
KCCB	Keep Copperas Cove Beautiful
MS Teams	Microsoft Teams
NPS	Nonpoint Source
NRCS	Natural Resources Conservation Service
OSSF	On-Site Sewage Facility
Partnership	Lampasas River Watershed Partnership
QPR	Quarterly Progress Report
SWCD	Soil and Water Conservation Districts
TCEQ	Texas Commission on Environmental Quality
TIAER	Texas Institute for Applied Environmental Research
TSSWCB	Texas State Soil and Water Conservation Board
TSWQS	Texas Surface Water Quality Standards
TWON	Texas Well Owner Network
TWRI	Texas Water Resources Institute
TWS	Texas Watershed Stewards
WC	Watershed Coordinator
WCID	Water Control and Improvement District
WPP	Watershed Protection Plan
WQMP	Water Quality Management Plan

INTRODUCTION

PROJECT BACKGROUND

The Lampasas River watershed lies within the Brazos River Basin in Central Texas. The Lampasas River's headwaters are in eastern Mills County, and it flows southeast for 75 miles, passing through Hamilton, Lampasas, Burnet and Bell counties. In Bell County the river turns northeast and is dammed five miles southwest of Belton to form Stillhouse Hollow Lake. Stillhouse Hollow Lake is the primary drinking water supply for much of the surrounding area. The watershed encompasses 798,375 acres across Mills, Hamilton, Coryell, Lampasas, Burnet, Bell, and Williamson Counties. The Lampasas River is primarily a rural watershed with few urban centers. The cities of Lampasas and Kempner are wholly within

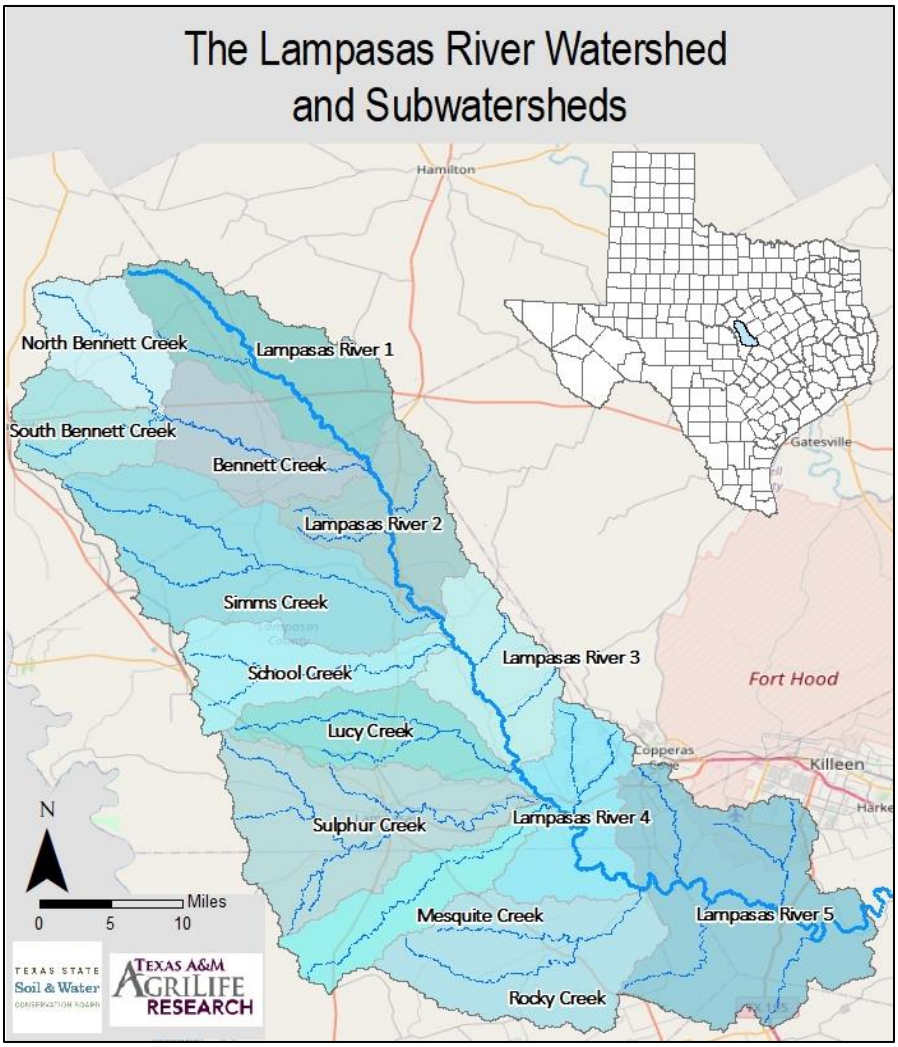


Figure 1 The Lampasas River watershed is a primarily rural watershed, located in Central Texas in the Brazos River basin.

the watershed boundaries, while the cities of Copperas Cove and Killeen are only partially in the watershed.

The Lampasas River was originally listed on the 2002 303(d) List for not meeting the Texas Surface Water Quality Standards (TSWQS) due to elevated levels of bacteria, primarily *Escherichia coli* (e. coli). It was then carried forward to subsequent lists in 2004, 2006 and 2008. Elevated bacteria levels are an indicator of fecal contamination from warm blooded animals is a human health hazard. Texas A&M AgriLife Research (AgriLife Research) and Texas State Soil and Water Conservation Board (TSSWCB) established the Lampasas River Watershed Partnership (Partnership) in November 2009. This was made possible with funding from the United States Environmental Protection Agency (EPA) Clean Water Act (CWA) §319(h) Nonpoint Source (NPS) grant program as part of TSSWCB project 07-11, "*Lampasas River Watershed Assessment and Protection Project*". The project included an updated land use analysis, modeling of historical water quality data, and the development of a Watershed Protection Plan (WPP) to address the bacteria impairment.

The development of the WPP was a stakeholder driven process facilitated by AgriLife Research. With technical assistance from AgriLife Research and other state and federal partners, the Steering Committee identified water quality issues that are of particular importance to the surrounding communities. The Steering Committee also contributed information on land uses and activities that were utilized in identifying the potential sources of bacterial impairments and in guiding the development of the WPP. The WPP identified responsible parties, implementation milestones, and estimated financial costs for individual management measures and outreach and education activities. The plan also described the estimated load reductions expected from full implementation of all management measures. To provide an accurate measure of the effectiveness of the WPP, the Partnership recommended an intensive water quality monitoring regime within the river and its tributaries. TSSWCB projects 13-09, 16-06 and 19-54 were utilized to collect surface water quality samples monthly to build a robust dataset.

Subsequent projects in the watershed have continued the implementation of the WPP, including TSSWCB project 12-09, "*Coordinating Implementation of the Lampasas River Watershed Protection Plan*" and TSSWCB project 14-07, which focused on coordinating the implementation of the WPP while, TSSWCB projects 14-06 and 17-03 provided resources at the local level to Hill Country Soil and

Water Conservation District (SWCD) to support a watershed-wide District Technician to facilitate the development of Water Quality Management Plans (WQMPs) and implementation of nonpoint source best management practices (BMPs) with local landowners. AgriLife Research has also cooperated with Texas Commission on Environmental Quality (TCEQ) to address potential failing on-site sewage facility (OSSF) through several projects.

It is important to note that the Lampasas River was removed from the 2010 303(d) list. The delisting of the river occurred because additional data had not been collected for assessment between 2000 and 2009; existing historical data no longer met the TCEQ criteria to be included in assessment. North Rocky Creek (Segment 1217D) was identified as impaired for depressed dissolved oxygen in 2006, however a TCEQ study conducted in 2009 showed high aquatic life. Biological data collected from North Fork Rocky Creek indicates that it supports a relatively healthy biological community, better than that which would be expected based upon the results of the dissolved oxygen monitoring. In 2010, the TCEQ adopted revised, site-specific standards for dissolved oxygen in Rocky Creek which then received EPA approval. Although the site-specific standards had been approved for the segment, a minimum of ten additional data points was necessary to assess against the new standards. TSSWCB Project 16-06 collected five of those data points and TSSWCB Project 19-54 collected the remaining five data points. These data points will be used in the assessment for the 2022 Integrated Report. It is expected that the segment will be removed from the impaired list at that time.

Over the years, other tributaries have been placed on and removed from the Integrated Reports as concerns based on screening levels. A portion of Sulphur Creek (Assessment Unit (AU) 1217B_02) had a screening level concern for depressed dissolved oxygen, while Clear Creek (AU 1217G_01) had a screening level concern for nitrate in 2014 Integrated Report. The 2016 Integrated Report also included a new listing for Sulphur Creek (Segment 1217B_02) for not meeting the state contact recreation standard. The most recent Integrated Report (2020) carries forward the depressed dissolved oxygen impairment for North Fork Rocky Creek as the only impairment in the watershed. However, there were several segments with concerns for use attainment and screening levels. Assessment unit 1217_05 (portion of Lampasas River from confluence with Bennett Creek upstream to its headwaters in Mills County) has a concern for near-nonattainment of the TSWQS based on numeric criteria for bacteria in the water and a concern for water quality based on screening levels for

Chlorophyll-a in water. Assessment unit 1217B_02 (from the spring source located in the City of Lampasas upstream to the confluences with Bean Creek and East Fork Sulphur Creek west of Lampasas in Lampasas County) was listed as having concerns for depressed dissolved oxygen totals in water.

PROJECT DESCRIPTION

Through this project AgriLife Research continued to work with cities, counties, local businesses, landowners, etc. and partner agencies such as the United States Department of Agriculture – Natural Resource Conservation Service (NRCS), local SWCDs, and the TCEQ to facilitate implementation as outlined in the WPP. AgriLife Research assisted governmental and non-governmental organizations in the Lampasas River watershed with identification and acquisition of resources to enable WPP implementation.

The Watershed Coordinator (WC) continued managing the outreach and education programs as outlined in the WPP to support public participation by private individuals and local officials in the implementation of the Lampasas River WPP. The watershed coordinator developed publications, such as a newsletters, factsheets, and website content, to promote and communicate watershed pollution prevention efforts.

PROJECT GOALS

1. To foster coordinated assistance activities for the Lampasas River Watershed Partnership
2. To conduct regular stakeholder meetings to encourage citizen participation, provide partners with updates on progress and seek stakeholder input and recommendations on needed activities
3. To support and facilitate the Partnership in identifying management measures to improve water quality, developing proposals to acquire funding for implementation of management measures, managing and tracking implementation projects as well as encourage adoption of BMPs
4. Evaluate progress toward achieving milestones established in the WPP
5. Coordinate and conduct water resources and related environmental outreach/education efforts across the watershed

PROJECT TASKS AND ACCOMPLISHMENTS

TASK 1 – PROJECT ADMINISTRATION

The WC prepared and submitted quarterly progress reports (QPRs) to TSSWCB. Conference calls and in person meetings with project cooperators and the TSSWCB Project Manager were held at least quarterly to discuss project deliverables, timelines, communications, and budgets. The WC prepared and submitted workplan and budget amendments to TSSWCB as necessary. AgriLife Research also continued to host and maintain the project website (http://lampasasriver.org/) throughout the project. Meeting and workshop announcements were placed on the website along with newsletters and other information relative to the Partnership.

TASK 2 – SUPPORT AND FACILITATION OF WPP IMPLEMENTATION

AgriLife Research continued to employ a WC to engage and facilitate the Partnership. The WC was responsible for the general oversight and coordination of all project activities, for the reporting requirements and directing educational activities. The WC also served as the primary conduit for interaction with landowners, citizens, and entities to facilitate the implementation of the WPP during this project.

PARTNERSHIP STEERING COMMITTEE

AgriLife Research facilitated public participation and stakeholder involvement in the watershed planning process, specifically by coordinating meetings of the Partnership Steering Committee updates on progress to implement the WPP. These meetings also provided the opportunity to update the Partnership on the status of monitoring efforts, progress in identifying implementation funding, and movement towards sustaining and improving water quality. The WC also sought input and recommendations from the Partnership on needed activities during these meetings. Partnership Steering Committee meetings were held in Lampasas at the Lampasas County Farm Bureau building on April 19, 2018, October 25, 2018, and July 25, 2019.

The Partnership began with a Steering Committee comprised of 19 local citizens and stakeholders, all voted in by the Partnership in November 2009. Members serving on the Steering Committee reflected diversity in areas of interest as well as the diverse geography within the watershed. Throughout the development

and implementation of the WPP, the membership has changed as members' needs have changed focus or moved into or out of the area.

At the July 2019 Partnership meeting, the original Steering Committee agreed to restructure the committee to a smaller, more manageable group. This new Steering Committee is comprised of 7 positions, 4 topic specific positions (city government, county government, agriculture producer, and wildlife producer) and 3 at-large positions. The new Steering Committee is comprised of members Mr. Tom Casbeer (Agriculture Producer), Mr. Chris Meis (Wildlife Producer), Mr. Finley deGraffenried (City Government), Commissioner Dickie Clary (County Government) and three At-Large members, Mr. Scott Brooks, Mr. Kenneth Schoen, and Mr. Donald Parrish. The Steering Committee also updated and revised the Partnership Ground Rules to reflect current goals during that time.

No Partnership meetings were held during the latter part of the project due to the COVID-19 Pandemic.

ACQUISITION OF FINANCIAL AND TECHNICAL RESOURCES

The WC assisted governmental and non-governmental organizations in identification and acquisition of resources (financial and technical) to enable WPP implementation. AgriLife Research actively pursued funding opportunities with both TCEQ and TSSWCB and worked with partners to develop grant proposals. Below is synopsis of projects and proposals that were developed to facilitate the implementation of the WPP:

Surface Water Quality Monitoring:

The WC developed proposals and then provided project oversight for two projects that collected surface water quality data. Each of these projects provided surface water quality monitoring monthly at 5 mainstem river sites and 5 tributary sites. AgriLife Research provided project management and the Texas Institute for Applied Environmental Research (TIAER) collected field and laboratory data. A synopsis of this data and data collected by other agencies in the watershed is included in this report.

TSSWCB 16-06, Continuation of Surface Water Quality Monitoring to Support the Implementation of the Lampasas River Watershed Protection Plan, II (October 1, 2016 – September 30, 2019)

TSSWCB 19-54, Continuation of Surface Water Quality Monitoring to Support the Implementation of the Lampasas River Watershed Protection Plan, III (April 1, 2019 – January 31, 2021)

TSSWCB 20-11, Continuation of Surface Water Quality Monitoring to Support the Implementation of the Lampasas River Watershed Protection Plan (October 1, 2020 - September 30, 2023; on-going)

Implementing Agricultural Nonpoint Source Components:

The WC coordinated with the Hill Country SWCD #534 to develop proposals to provide technical assistance to landowners within the watershed by supporting a full time District Technician (DT). The DT assisted landowners in applying for and obtaining financial incentives to aid in implementation of BMPs prescribed in WQMPs. Examples of the BMPs installed were Forage and Biomass Planting, Range Planting, Cross Fencing, Prescribed Grazing, and Brush Management. As of May 2020, a total of 27 WQMPs had been implemented within the watershed (Figure 2) utilizing funds made available through the following projects:

TSSWCB 17-03, Continued Implementation of Agricultural Nonpoint Source Components of the Lampasas River Watershed Protection Plan (November 1, 2017 – December 31, 2020)

TSSWCB 17-01, Funding for Financial Assistance to Implement Agricultural BMPs (October 1, 2017 – September 30, 2022)

TSSWCB 20-07, Implementation of Agricultural Nonpoint Source Components of the Lampasas River Watershed Protection Plan (September 1, 2020 - August 31, 2023; on-going)

TSSWCB 20-02, Funding for Financial Assistance to Implement Agricultural BMPs (September 1, 2020 - August 31, 2025; on-going)

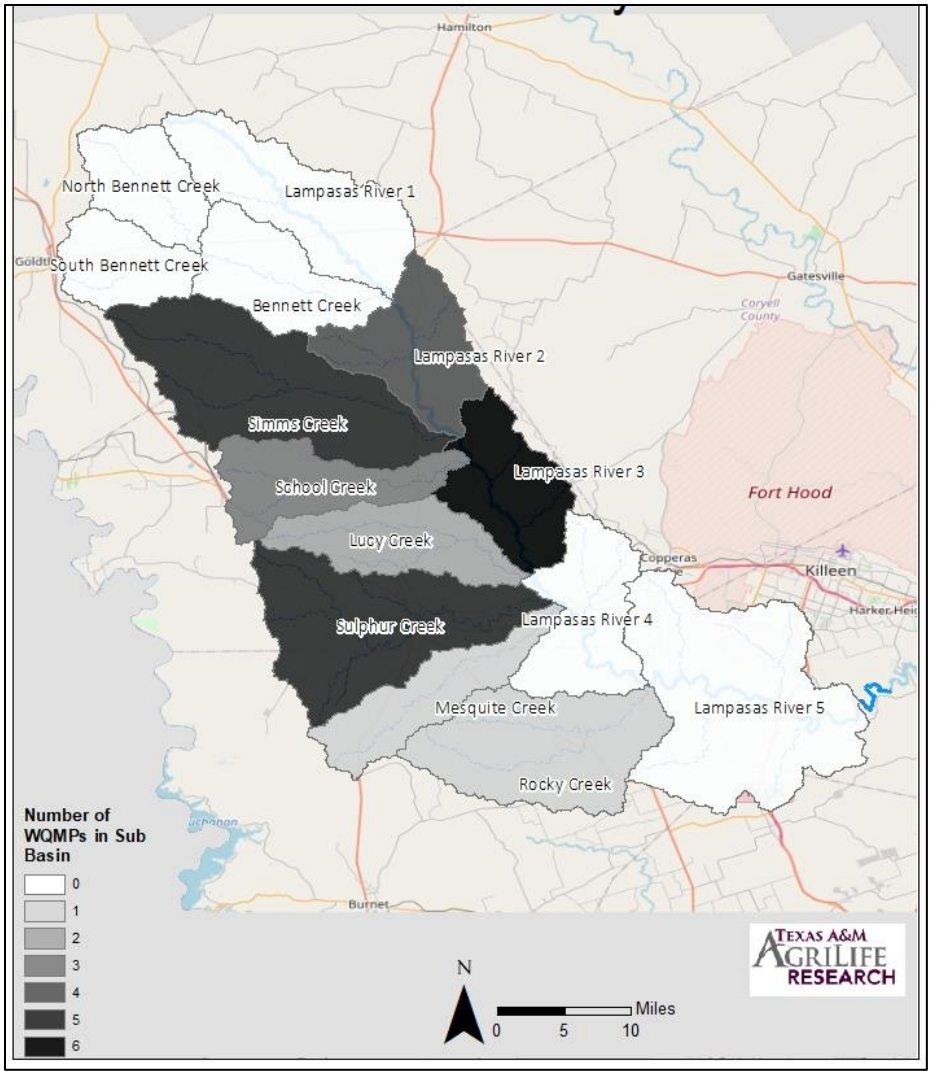


Figure 2 A total of 27 WQMPs have been put into place within the watershed since 2013.

Implementing On-Site Sewage Facility Components:

The WC coordinated with AgriLife Extension and the Texas A&M Biological and Agricultural Engineering (BAEN) Department to implement the OSSF components of the WPP. The initial project developed a watershed-wide database with concise locations and details about the OSSFs in the watershed. The geodatabase was used to facilitate the efficient use of funds in the subsequent OSSF remediation project (Figure 3). The second project acquired funding to replace approximately 15 failing OSSFs within the watershed (Figure 4) by September 2022. As of May 2021, three failed OSSFs have been replaced and an additional three systems are pending replacement.

TCEQ 17-70432, Lampasas River Watershed Protection Plan Implementation – On-Site Sewage Facilities Database (November 1, 2016 – October 31, 2018)

TCEQ 20-10176, Lampasas River Watershed Protection Plan Implementation – On-Site Sewage Facilities Remediation (October 1, 2019 – September 30, 2022; on-going)

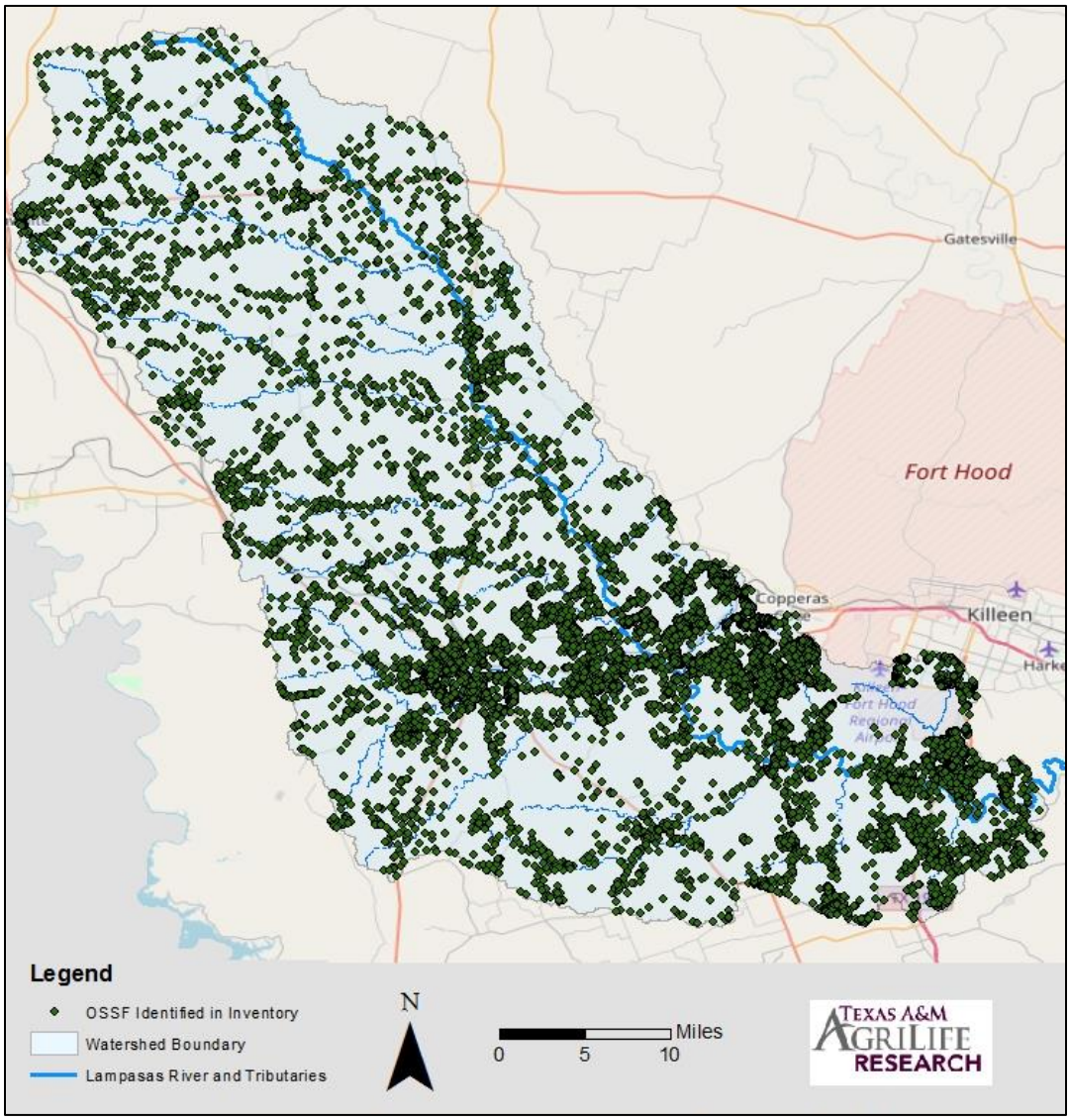


Figure 3 OSSF inventory points within the Lampasas River watershed.

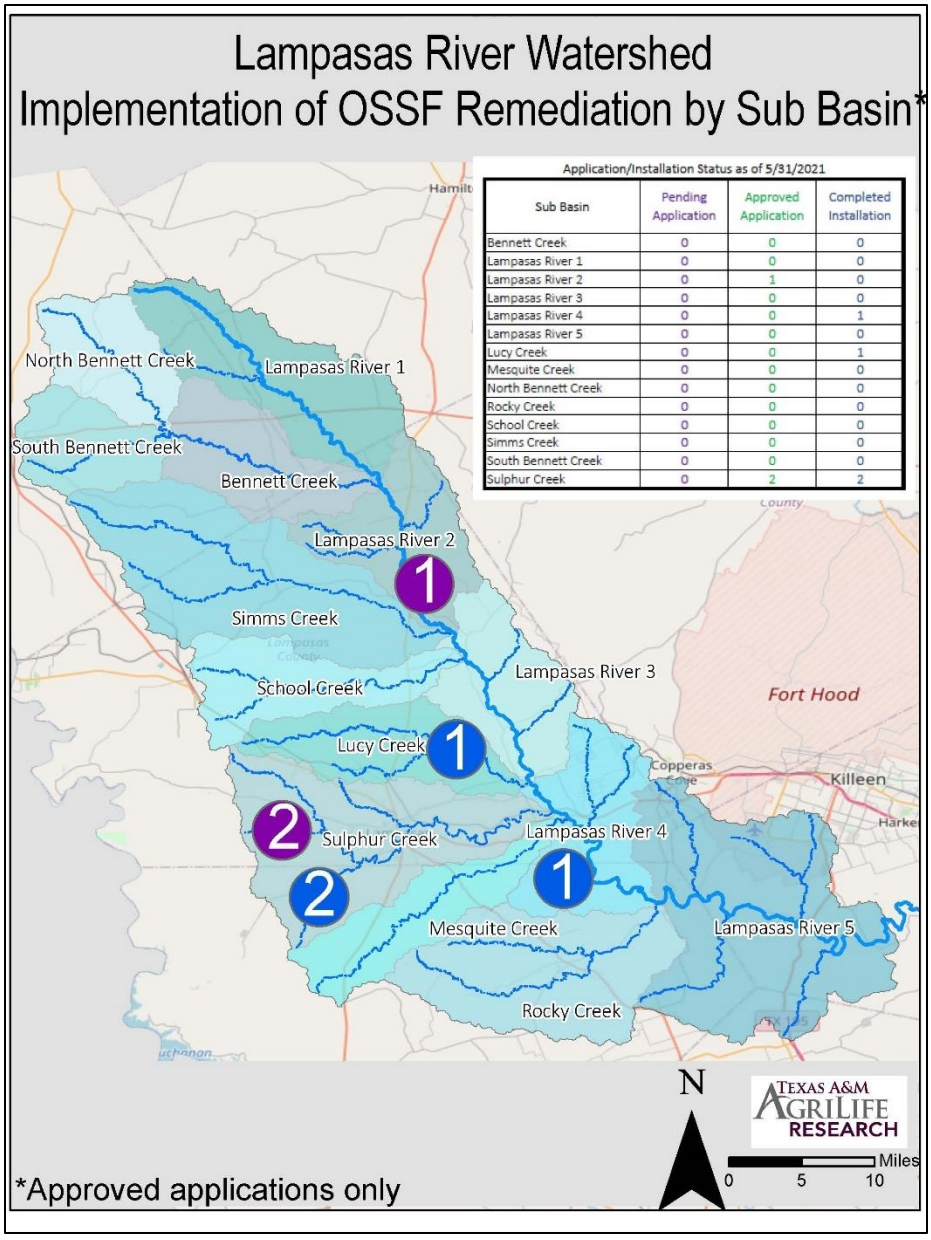


Figure 4 Implementation of OSSF Remediation through the repair or replacement of failing OSSFs within the watershed.

Implementing Education Components and Coordination:

The WC also submitted a proposal to continue funding for the education programs as outlined in the WPP as TSSWCB 17-05 wrapped up. This project allows AgriLife Research to continue to fund a full time WC as well as the educational programs that are outlined with in the WPP at the completion of this current project.

TSSWCB 20-10, Coordination and Implementation of the Lampasas River Watershed Protection Plan (December 1, 2020 - November 30, 2023; on-going)

WEBSITE, NEWSLETTERS AND NEWS MEDIA

The WC maintained a stakeholder database of 814 people. The WC remained in contact through multiple newsletters and other emailed announcements over the course of the project.

Press releases were also disseminated to local news outlets, through AgriLife Research's Facebook, TSSWCB, and AgriLife Today announcing meetings and educational programs. Meeting announcements were also placed on the AgriLife Research Facebook page (https://www.facebook.com/TAMUSBREC).

AgriLife Research continued to maintain the project website http://www.lampasasriver.org/ (Figure 5) that was developed as part of the initial project TSSWCB 07-11. The website serves as a public clearinghouse for all project and watershed related information. The website serves to disseminate information to stakeholders and the general public. Agendas, news releases, presentations, newsletters are all posted to the website. The website was also updated with resources for homeowners utilizing OSSFs, including links to local permitting authorities, and educational materials regarding the proper operation of an OSSF.

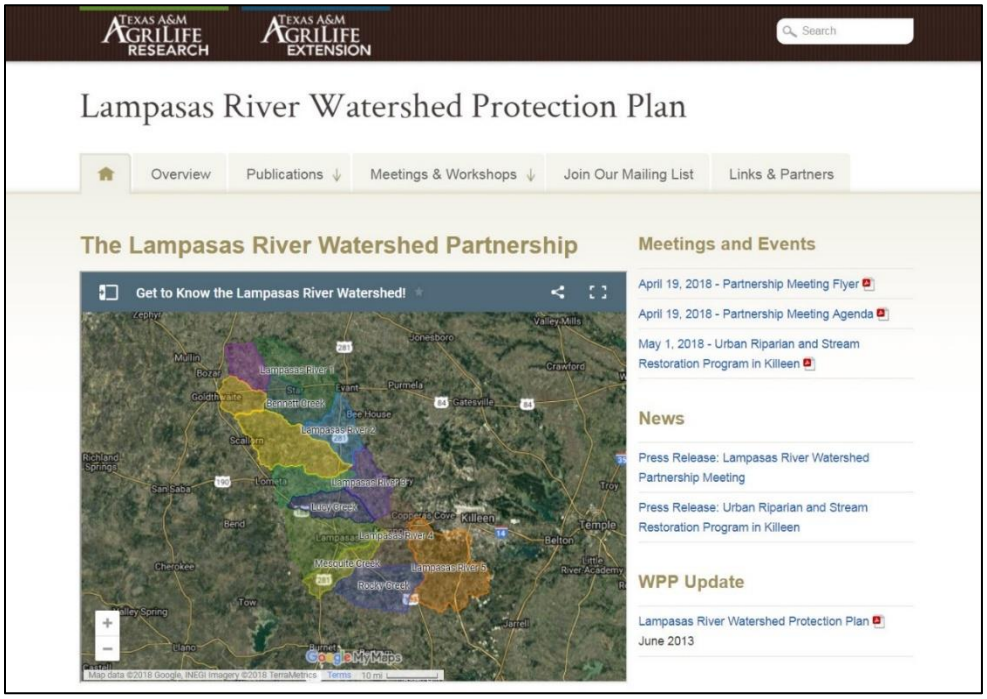


Figure 5 A screenshot of the project website, lampasasriver.org, taken in March 2018.

TASK 3 – OUTREACH, EDUCATION, AND COMMUNITY SUPPORT

Developing a culture of local watershed stewardship through outreach and education is an important component of a successful watershed protection plan. Stakeholders may or may not be aware of the impact that their daily lives make on the health of their watershed. It is crucial to create an awareness of the water quality issues that the Lampasas River watershed faces, as well as provide stakeholders the necessary tools to make informed decisions about their watershed. The WPP recommended outreach and educational opportunities that the stakeholders wanted to host within the watershed. These programs were chosen specifically because they would raise awareness of how daily actions can impact water quality and could increase good land stewardship by the participants. Subtask 3.2 of the workplan outlined the specific educational programs that were of interest to the Partnership. Most of these workshops were carried out as planned although some changed in scope or number offered. In some cases, such as the Aerobic System Operation and Maintenance Workshops for Homeowners, the workshop was completely cut from the program due to lack of interest or changes in agency personnel that made programmatic changes. Other programs that had more local interest were offered more than what was originally proposed, such as the Rainwater Harvesting for Homeowners workshop, which was offered twice, rather than the proposed one time. The following section includes a brief synopsis of the programs that were hosted in the watershed through this project.

It should be noted that, although many educational programs were planned for 2020, due to the COVID-19 Pandemic, most were cancelled, and a few were moved to a virtual platform in the interest of protecting public health.

HOMEOWNER'S MAINTENANCE OF SEPTIC SYSTEMS CLINIC

The WC coordinated with Texas A&M University Biological and Agricultural Engineering Department to present informal clinics about OSSFs. These clinics provided a basic understanding of the operational and maintenance needs of a conventional septic system and explained how activities within the home impact septic systems. Presentations covered the treatment processes, health, and safety considerations, and how to inspect and maintain the system. This course also provided answers to the most frequently asked septic system questions, including when to pump out a tank and what can or cannot go down the drain. Participants were able to pose questions to state wastewater experts. Due to the COVID-19 Pandemic, these clinics were held virtually

through the Microsoft Teams Platform (MS Teams) on December 10, 2020, and April 7, 2021. The clinics were attended by 17 and 21 participants, respectively.

RIPARIAN AND STREAM ECOSYSTEMS TRAINING

The WC coordinated with Texas Water Resources Institute (TWRI) to host a Riparian and Stream Ecosystems Training for landowners. This training focused on the nature and function of riparian zones, the benefits, and direct economic impacts from ecological services of healthy riparian zones, BMPs for enhancing and protecting riparian zones, and technical and financial resources and incentives available for implementing riparian BMPs and riparian protection measures. This one-day training held on October 23, 2018, included indoor classroom presentations at the Lampasas County Farm Bureau and outdoor field sites and stream walks at the nearby Crawford Ranch. The workshop was attended by 42 participants (Figure 6).

Figure 6 Participants at the Riparian and Stream Ecosystem Training event pose for a group picture prior to breaking up into small groups at the field site along Sulphur Creek.

TEXAS WATERSHED STEWARDS

The Texas Watershed Steward (TWS) program is a statewide one-day educational program designed to improve the quality of Texas' water resources by educating and informing local stakeholders about their watershed, potential impairments, and steps that can be taken to help improve and protect water quality in their watershed. The program is sponsored by AgriLife Extension and the TSSWCB and made possible through a CWA §319(h) nonpoint source grant

from the TSSWCB and the EPA. The goal of the TWS program is to promote healthy watersheds by increasing citizen awareness, understanding, and knowledge about the nature and function of watersheds, potential impairments, and watershed protection strategies.

Two TWS programs were held in during this project. The first was a joint program in Harker Heights on March 6, 2019. The Lampasas River WC collaborated with the Nolan Creek WC to host a joint TWS program in Harker Heights on March 6, 2019; 36 people were in attendance. A second TWS was held on January 28, 2021. This program was initially scheduled to be a hybrid in-person/virtual class due to the COVID-19 Pandemic, however, it was moved completely online due to a spike in COVID-19 cases in the area prior to the program. A total of 28 attendees signed in at the workshop. At each TWS, the WC presented a discussion of the implementation efforts being made in the Lampasas River Watershed for the Lampasas River WPP.

SAVING FROM A RAINY DAY – RAINWATER HARVESTING WORKSHOPS

Rainwater harvesting is an innovative and efficient means of utilizing water. This process collects rainwater, stores it so it will be available when needed. Not only does rainwater harvesting help provide an additional source of water, but it also helps mitigate contamination of surface water due to stormwater runoff by allowing the rainwater to be filtered more than it typically would if it just drained directly into the local waterways. Rainwater harvesting was identified by the Lampasas River Watershed Partnership as a way for homeowners to help improve water quality in Lampasas River watershed.

Two Rainwater Harvesting for Homeowners programs were hosted in conjunction with Keep Copperas Cove Beautiful (KCCB) as a joint effort between the Partnership, AgriLife Research, and AgriLife Extension (Figure 7). These workshops were held on March 29, 2018, and March 5, 2020, at the Copperas Cove Library. Participation in the workshops was free, but attendees had the opportunity to build and take home a 55-gallon rain barrel for $50. At each workshop, KCCB sponsored $25 off the cost of the barrel for the first 25 participants.

- March 29, 2018
  - KCCB sponsored $25 off the cost of the first 25 barrels that were reserved by participants that had not received a discounted barrel at previous programs.
  - A total of 43 participants attended the workshop, with 25 of them building and taking home rain barrels.

Figure 7 Participants learned how to build their own rainwater harvesting barrel in Copperas Cove on March 5, 2020.

- March 5, 2020
  - KCCB sponsored $25 off the cost of the first 25 barrels that were reserved by participants that had not received a discounted barrel at previous programs.
  - A total of 54 participants attended the workshop, with 50 of them building and taking home rain barrels.

TEXAS WELL OWNER NETWORK AND WELL SCREENED EVENTS

The Texas Well Owner Network (TWON) program is an educational training coordinated by AgriLife Extension and made possible through a CWA §319(h) nonpoint source grant from the TSSWCB and EPA. The TWON program is for Texas residents who depend on household wells for their drinking water needs. It focuses on protecting ground water quality, aquifer integrity, and complements the successful Texas Watersheds Stewards program by emphasizing BMPs. AgriLife Extension offers voluntary private water well screening events and TWON trainings. As a result, participants have a better understanding of the relationships between practices in or near wells and the quality of water available for drinking and irrigation.

The Partnership hosted one Well Educated Session within the watershed on August 8, 2019 (Figure 8). As part of the Well Educated Program, participants were able to bring water samples from private wells to be screened for common contaminants including fecal coliform bacteria, nitrates, arsenic and high salinity. Participants returned the following day to pick up results and attend a 4-hour workshop about how to interpret their results and practices to protect the quality of their private wells. The WC gave a presentation about the current efforts that are ongoing within the watershed. The program had over 100 participants and 91 samples submitted for private well screening tests.

Figure 8 Over 100 local well owners turned out to learn more about operating and protecting their private water well on August 8, 2019, in Lampasas.

URBAN RIPARIAN AND STREAM RESTORATION PROGRAM

The Urban Riparian and Stream Restoration Program is an educational program focused on natural stream design. It is a one-day urban riparian and stream restoration training on assessing and restoring degraded urban riparian areas geared toward professionals interested in restoration activities including those with municipalities, local/state/federal agencies, river authorities, water districts, land trusts and environmental organizations as well as consultants.

The morning session consisted of educational presentations focused on protecting water quality and restoring riparian buffers, stream classification and restoration, watersheds, and environmentally sensitive areas, followed by lunch. At the afternoon session, attendees performed a stream evaluation at a nearby stream and received a certificate of completion.

The WC coordinated with TWRI and Bell County AgriLife Extension to offer this program on May 1, 2018, in Killeen. However, the program was cancelled due to lack of interest and registered participants. After discussion with local municipalities and TWRI and area watershed coordinators, the program was moved to Belton to attract more attendees. The program was held in Belton on November 29, 2018, attended by 30 people.

OTHER WORKSHOPS AND EDUCATIONAL OPPORTUNITIES

The WC supported, promoted, and participated in several field days, demonstrations, site tours, and educational events sponsored by AgriLife Extension, NRCS, and/or SWCDs and other partners for the Lampasas River Watershed.

BRAZOS RIVER AUTHORITY CLEAN RIVERS PROGRAM

The Brazos River Authority (BRA) was created by the Texas Legislature in 1929 and was the first State agency in the United States created specifically for the purpose of developing and managing the water resources of an entire river basin. The BRA monitors water quality and pursues water conservation through public education through the Clean Rivers Program. The BRA holds annual meetings to review water quality activities in the basin. The WC participated in these annual CRP Steering Committee meetings, providing updates as requested in 2018, 2019, and 2020.

The WC also provided a list of monitoring activities to BRA to be included in the Brazos River Basin Annual Coordinated Monitoring and attended the planning meetings yearly at the BRA's Central Office in Waco.

BELL COUNTY WATER SYMPOSIUM

The Clearwater Underground Water Conservation District in Bell County holds an annual Water Symposium that is intended to share water related issues with the residents and decision makers of Bell County. Topics vary from year to year, but typically changes in climate predictions and state laws are at the top of the discussion list. The WC has participated in this event almost every year since the beginning of the WPP development in the Lampasas River watershed.

November 2018

The WC hosted an exhibitor's booth at the 18th Annual Water Symposium on November 15, 2018, at the Texas A&M Central Texas campus in Killeen. The WC exhibited materials detailing the Partnership's activities in the Lampasas River watershed and copies of the Watershed Protection Plan were handed out. The WC spoke with many interested landowners from both within and outside of the watershed. The symposium was attended by 158 people.

November 2019

The WC hosted an exhibitor's booth at the 19th Annual Bell County Water Symposium (Figure 9) on November 6, 2019, speaking with various stakeholders about the implementation of the Lampasas River WPP. The program was held at the Texas A&M Central Texas campus in Killeen and was attended by 157 people.

November 2020

Clearwater Underground Water Conservation District had to forgo the Annual Water Symposium in 2020 due to the COVID-19 Pandemic. The district plans to host the event again in November 2021.

Figure 9 Exhibitor's booth at the Bell County Water Symposium in November 2019.

BELL COUNTY CONSERVATION EXPO

The WC collaborated with Bell County AgriLife Extension Natural Resources Committee to host the Annual Bell County Conservation Expo. Although the agenda changes yearly, the Conservation Expo presents topics of importance to landowners within Bell County.

September 2018

The 2nd Annual Bell County Conservation Expo was held on September 20, 2018, at the Bell County Exposition Center in Belton. Program topics were geared toward answering the questions and discussing the concerns of many new landowners and small acreage landowners in Central Texas. In addition to co-hosting, the WC set up an exhibitor's booth with information about the Lampasas River Watershed Partnership at the program. Approximately 90 people preregistered for the program and 115 people were in attendance, including speakers and exhibitors.

September 2019

The 3rd Annual Bell County Conservation Expo was held on September 29, 2019, at the Parrie Haynes Ranch, in Killeen. Topics discussed included locally led watershed protection, Agriculture agency updates, oak wilt and essentials for small landowners and other relevant topics. This program was open to the public and approximately 52 people were in attendance along with 25 vendors, speakers, and collaborators. The WC also hosted an informational booth for the Lampasas River Watershed Partnership at this event in addition to announcing speakers.

ANNUAL MEETING OF SOIL AND WATER CONSERVATION DISTRICT DIRECTORS

This annual meeting provides Soil and Water Conservation District Directors, SWCD employees, and others the opportunity to examine issues relevant to the conservation of the State's natural resources. Speakers from the local, state, and national levels address attendees concerning a wide variety of agricultural and conservation topics. The WC attended the annual meeting in 2018 and 2019, in Fort Worth and San Antonio, respectively. The WC was able to participate in sessions to learn about conservation efforts across the state in addition to hosting an exhibitor's booth detailing the efforts to develop and implement the Lampasas River WPP. The 2020 annual meeting was held virtually due to the COVID-19 Pandemic.

AG AND CONSERVATION SYMPOSIUM

The WC assisted the Hill Country SWCD with planning and hosting its inaugural Ag and Conservation Symposium, held September 6, 2019, in Lampasas (Figure 10). This program was a full day event, attended by 203 local landowners and an additional 45 vendors, speakers, and program collaborators. Topics included pesticide and herbicide updates, agency updates, brush management practices, wild pig updates and rainwater harvesting.

The Hill Country SWCD had to forgo the Annual Water Symposium in 2020 due to the COVID-19 Pandemic.

Figure 10 A screenshot of Texas A&M AgriLife Research: Blackland's Facebook page regarding the Ag and Wildlife Symposium held on September 6, 2019.

SULPHUR CREEK FLOOD CONTROL STRUCTURE SEMINAR

The WC assisted the Lampasas County Water Control & Improvement District 1 (WCID) in hosting a short seminar about the 9 flood control structures that are in the Sulphur Creek subwatershed. These flood control structures not only protect the community of Lampasas from flooding, but also protect water quality by slowing down stormwater runoff. This program was held in Lampasas on January 28, 2020. Partners for this program included TSSWCB, NRCS, the City of Lampasas, Lampasas County, and AgriLife Extension. The program was attended by over 100 concerned citizens (Figure 11).

Figure 11 Over 100 concerned citizens learned about the 9 flood control structures that protect the city of Lampasas and surrounding areas.

HIGHLIGHTS AND EVALUATION OF WATER QUALITY MONITORING DATA

As mentioned, AgriLife Research coordinated with TIAER and BRA to conduct routine ambient monitoring at 10 sites monthly (Figure 12 and Table 1) and, collecting field, conventional, flow, and bacteria parameter groups. The objective of the routine monitoring was to provide sound water quality data to more accurately assess the status of the Lampasas River. Analyzing this water quality data can show trends and the effectiveness of a WPP. TIAER and AgriLife Research coordinated with other entities, TCEQ and BRA, to avoid overlapping of resources, which allowed those agencies to focus their limited resources in other waterbodies. TIAER's laboratory also conducted the sample analysis. Field parameters were pH, temperature, conductivity, and dissolved oxygen. Conventional parameters were total suspended solids, turbidity, nitrate + nitrite nitrogen, Total Kjeldahl Nitrogen (TKN), chlorophyll-a, pheophytin, and total phosphorus (TP). Flow parameters were collected by electric, mechanical, or Doppler, including severity. Bacteria parameter is E. coli. A full list of parameters and field codes can be found in the appendix.

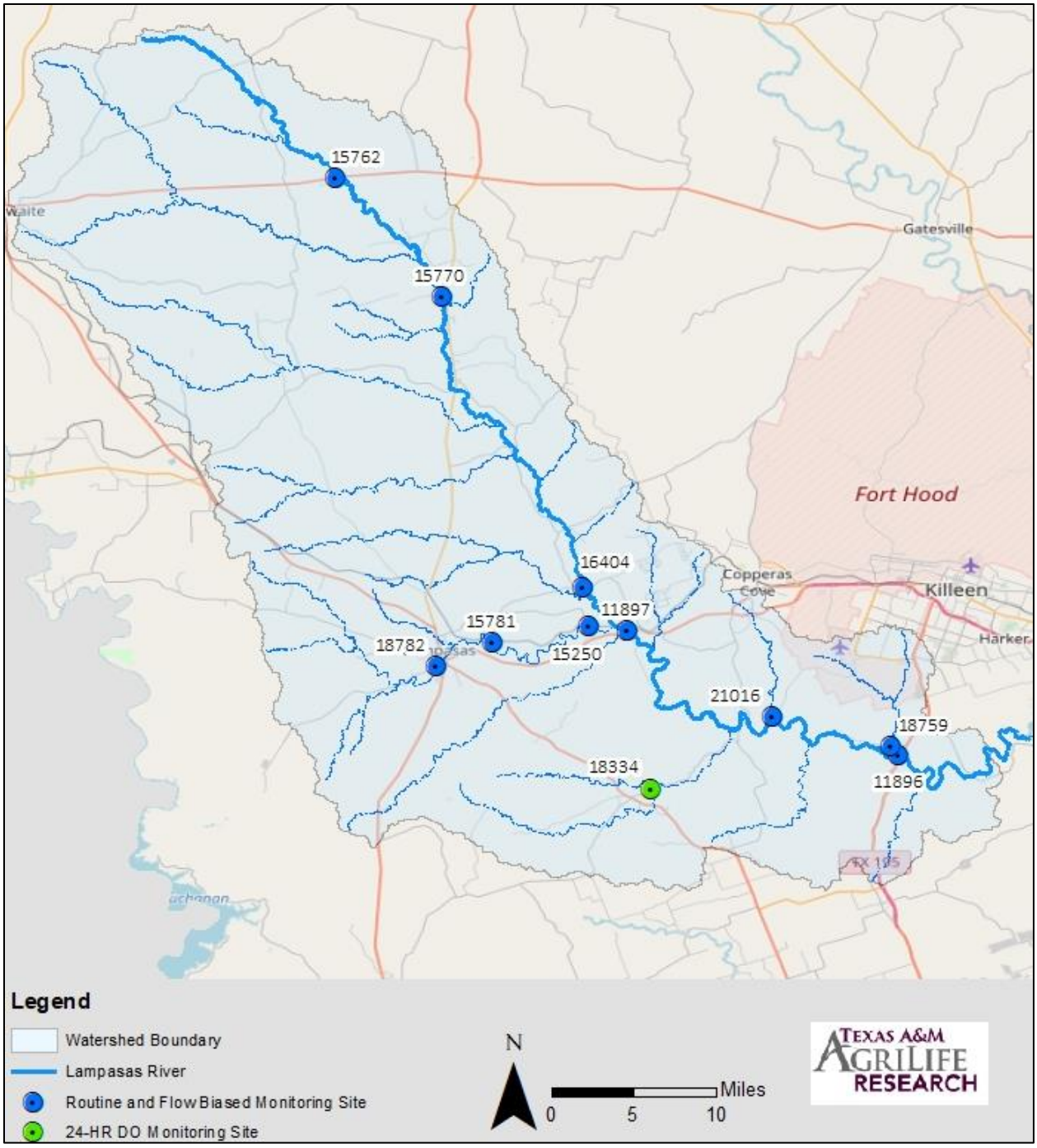


Figure 12 Ten sites were included in the long-term monitoring plan of the Lampasas River WPP.

DATA SUMMARIES

The following data was collected from 2010 through 2020 at varying frequencies depending on the site (Table 1). A total of 1,059 samples were collected by four different agencies during that time period (Table 2).

Table 1 Samples were collected at 10 sites between 2010 - 2020.

Number of Samples by Monitoring Type						
TCEQ Station ID	Station Description	Monitoring Type			Sampling Period	
		RT	BFBA	Total	Date of First Sample	Date of Last Sample
15762	Lampasas River at US 84	72	16	88	02/07/2011	11/10/2020
15770	Lampasas River at Lampasas CR 2925	86	16	102	02/07/2011	11/10/2020
16404	Lampasas River at FM 2313	130	16	146	09/29/2010	11/10/2020
11897	Lampasas River at US 190	92	16	108	03/08/2010	11/10/2020
11896	Lampasas River at HWY 195	129	16	145	09/29/2010	11/10/2020
18782	Sulphur Creek at Naruna Rd	60	16	76	07/10/2014	11/10/2020
15781	Sulphur Creek at Lampasas CR 3010	72	16	88	02/08/2011	11/10/2020
15250	Sulphur Creek at Lampasas CR 3050	91	16	107	03/08/2010	11/10/2020
21016	Clear Creek at Oakalla Rd	83	16	99	02/08/2011	11/10/2020
18759	Reese Creek at FM 2670	84	16	100	02/08/2011	11/10/2020
Total		899	160	1,059	03/08/2010	11/10/2020

Table 2 Samples were collected by multiple agencies.

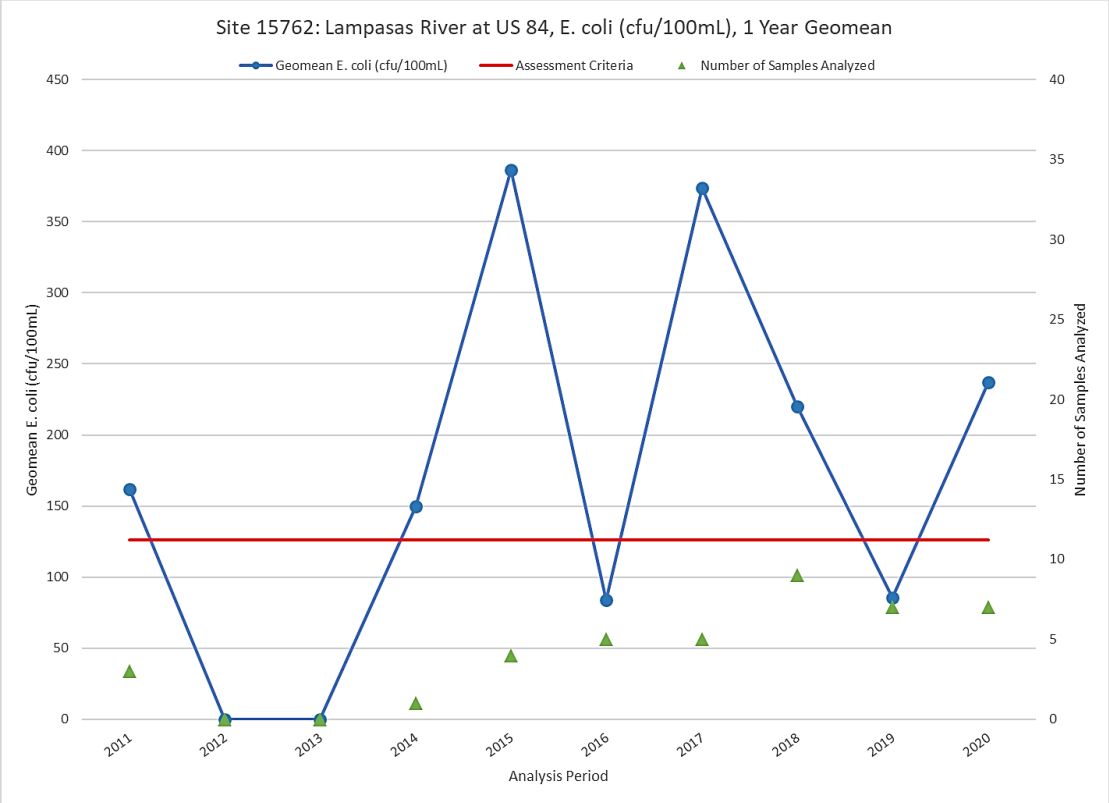
Collecting Entities Case Summaries			
Code	Collecting Entity	Number of Samples	% Of Total Samples Collected
BR	Brazos River Authority	62	6%
FO	TCEQ Field Office	128	12%
LR	AgriLife Research- Vernon/TWRI	108	10%
TA	Texas Institute for Applied Environmental Research	761	72%
Total		1059	100%

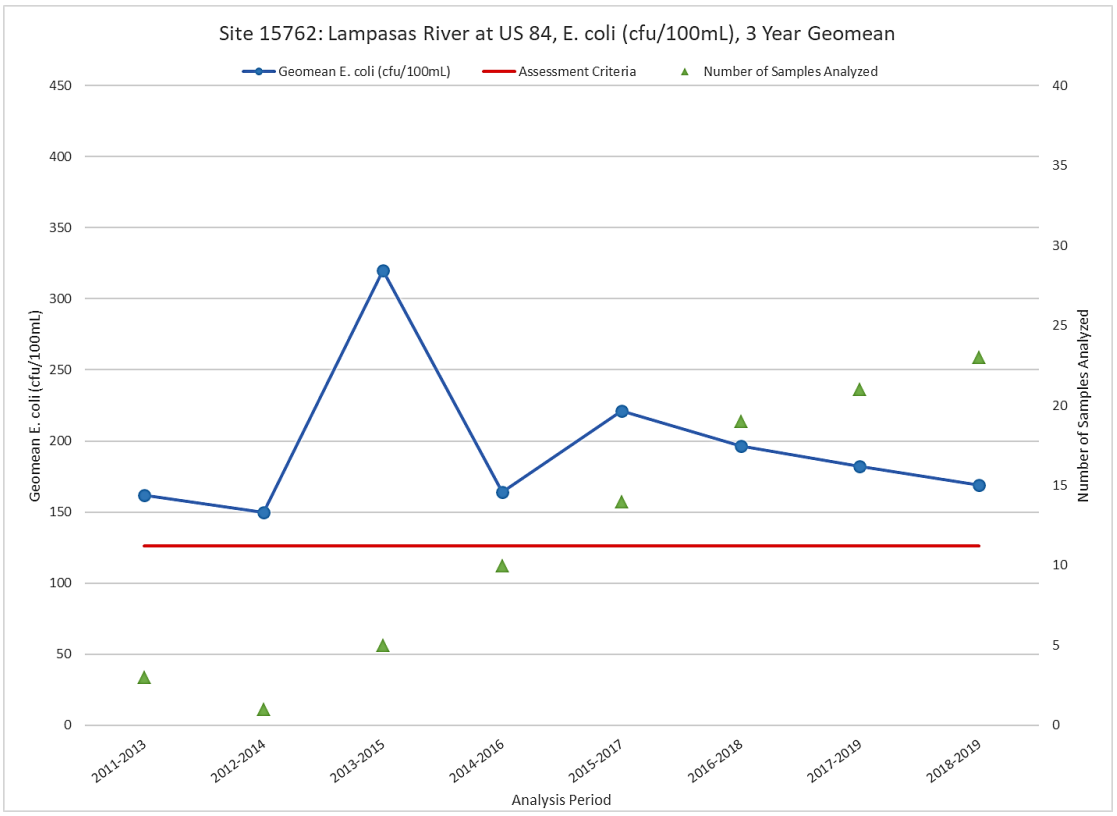
E. COLI

The following data tables compile the data collected to date at the routine sites. Table 3 compares the geometric mean of the *E. coli* data collected at each site during dry to normal conditions to the geometric mean of the data collected under high flow conditions. Similar tables for other measured parameters can be found in the appendix.

Apart from site 15762 (Lampasas River at US 84), all monitoring sites currently meet the standards for *E. coli* during the study period under routine sample conditions. Most sites are well below the state standard of 126 colony forming units per 100 milliliters (cfu/100mL). The geomean for site 15762 is 184 cfu/100mL. Site 15770 (Lampasas River at Lampasas CR 2925) is near the standard with a geomean of 115 cfu/100mL. The geomeans of all other sites are below 60 cfu/100mL.

A more thorough analysis of site 15762 illustrates the varying nature of the *E. coli* temporally. *E. coli* data was graphed with annual geomeans and rolling 3-year and 7-year geomeans (Figure 13A-C). As the analysis period and number of samples analyzed increases, the geomean levels out.





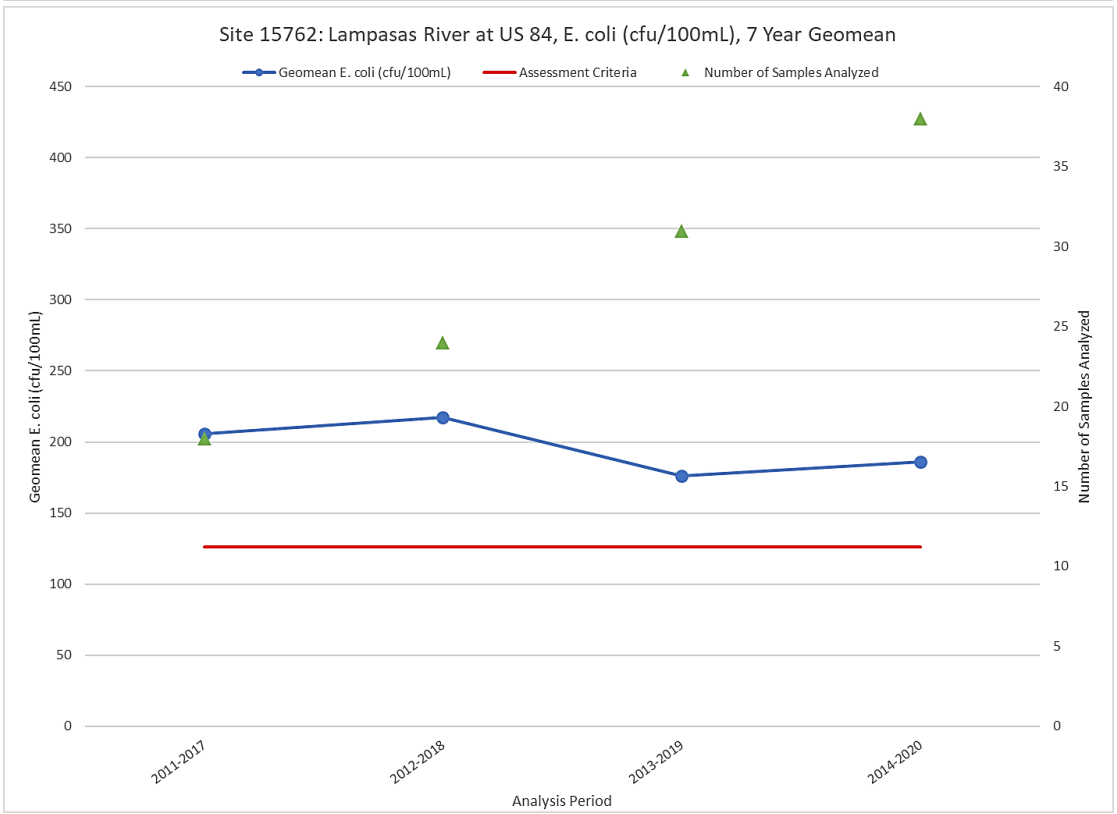
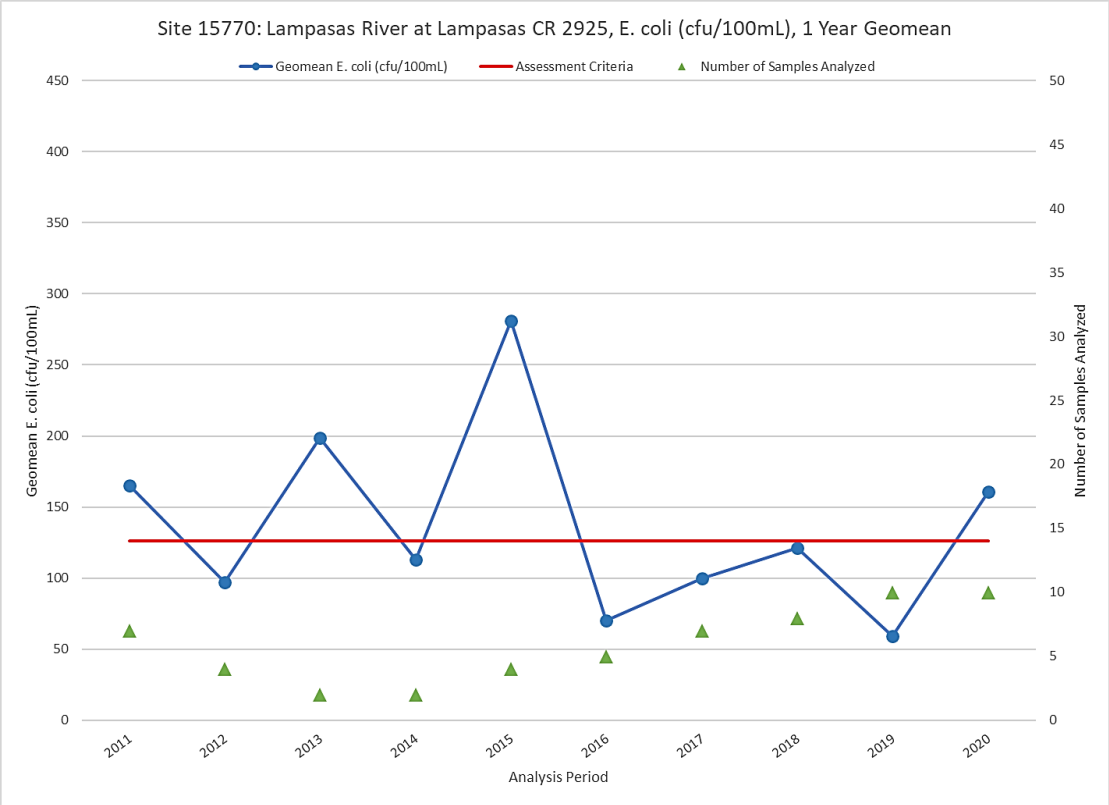


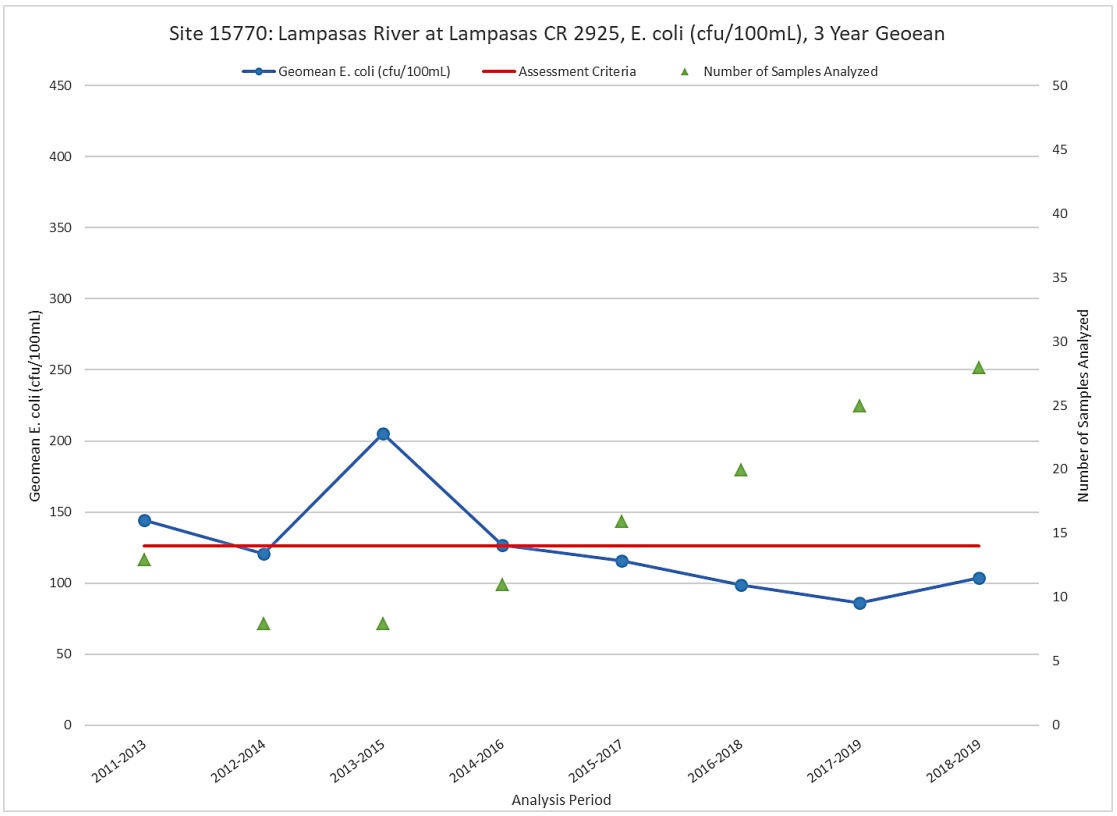
Figure 13A-C Annual, rolling 3- and 7-year *E. coli* geomeans for site 15762.

Table 3 Concentrations of *E. coli* during routine and biased flow conditions at all sites.

TCEQ Station ID	Monitoring Type															
	Routine Mainstem or Tributary Sample						Biased flow Sample						Total			
	Flow (cfs)		*E. coli* (cfu/100mL)				Flow (cfs)		*E. coli* (cfu/100mL)				Flow (cfs)		*E. coli* (cfu/100mL)	
	N	Mean	N	Geo-mean	Min	Max	N	Mean	N	Geo-mean	Min	Max	N	Mean	Geo-mean	*E. coli* % Change
Lampasas River at US 84	60	15	41	184	18	26,000	15	1,044	15	2,362	28	138,000	75	221	56	365
Lampasas River at Lampasas CR 2925	69	50	59	115	4	165,000	16	1,408	16	2,688	82	31,000	85	306	75	226
Lampasas River at FM 2313	100	82	99	51	1	10,300	16	1,768	16	2,042	57	30,000	116	315	115	85
Lampasas River at US 190	92	145	89	36	2	24,001	16	2,135	16	2,835	200	20,000	108	440	105	69
Lampasas River at HWY 195	101	221	98	0	0	18,000	16	2,738	16	5,125	540	28,000	117	565	114	0
Sulphur Creek at Naruna Rd	60	11	59	38	5	420	16	66	16	366	34	6,000	76	23	75	61
Sulphur Creek at Lampasas CR 3010	72	30	71	53	7	1,100	16	136	15	1,034	150	16,364	88	49	86	89
Sulphur Creek at Lampasas CR 3050	77	32	89	56	5	6,500	16	193	16	856	69	61,000	93	60	105	85
Reese Creek at FM 2670	74	7	82	39	2	6,400	16	143	16	1,821	43	16,300	90	31	98	74
Clear Creek at Oakalla Rd	73	6	79	60	1	4,000	16	156	16	1,709	71	8,000	89	33	95	106

The same trend is noted in site 15770 (Figure 14A-C) when looking at the longer term geomeans. Sites 15762 and 15770 are the two most upstream sites of the watershed and commonly experience low to no flow during periods of decreased rainfall.





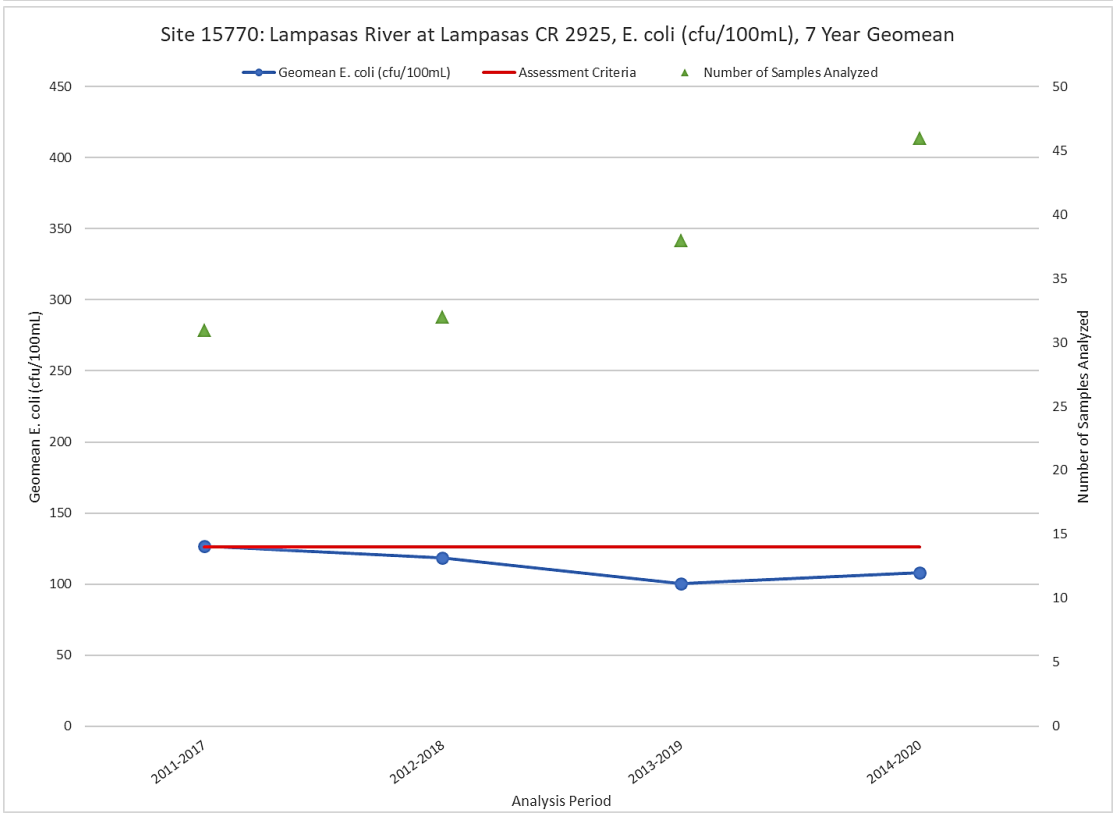


Figure 14A-C Annual, rolling 3- and 7- year *E. coli* geomeans for site 15770.

FUTURE LAMPASAS RIVER WATERSHED ACTIVITIES

The WC position was extended an additional 3 years and is currently funded through September 2023 through TSSWCB project 20-10 *Coordination and Implementation of the Lampasas River Watershed Protection Plan*. The WC will continue to reach out to stakeholders and engage the public in the implementation process. The Lampasas River WPP stakeholder meetings will continue to be on an as needed basis. The WC will continue to attend SWCD board meetings and other meetings regularly, explore and obtain external funding to support watershed activities, maintain website and other forms of communication, and generally support all Lampasas River WPP implementation efforts by holding a variety of outreach and education events throughout the watershed.

The WC will continue to maintain a database of watershed stakeholders and interested parties for use in engaging the public in the watershed planning process. The stakeholder group represents a diverse cross section of Lampasas River landowners, citizens, local businesses, local and regional governmental entities and elected officials, state and federal agencies, and environmental and special interest groups.

Through the past and active projects in the watershed, progress has been made implementing BMPs and addressing NPS pollution from feral hogs and livestock. The Partnership expects to submit a proposal during TCEQ's next Request for Grant Applications cycle to extend the current project that addresses failing OSSFs in the watershed through repair and replacement of systems. The Partnership will also continue to seek funding for long term monitoring of surface water in the river and its tributaries to assess changes and trends in the watershed.

As the landscape within the watershed continues to change and the footprint of the urban areas expands, it is imperative to be proactive about water quality and conservation within the Lampasas River watershed. In addition, as agriculture producers must produce more with less resources, conservation and soil and water quality will remain a top priority and need within the area.

Although the Lampasas River WPP outlines a ten-year timeline for full implementation; due to limitations in funding and resources, it is now expected to continue past the original expected endpoint of 2023.

APPENDIX

PARAMETER	UNITS	MATRIX	METHOD	PARAMETER CODE
Field Parameters				
pH	pH/ units	water	SM 4500-H^+ B. and TCEQ SOP, V1	400
DO	mg/L	water	SM 4500-O G. and TCEQ SOP, V1	300
Specific Conductance	µS/cm	water	SM 2510 and TCEQ SOP, V1	94
Temperature	°C	water	SM 2550 and TCEQ SOP, V1	10
Flow	cfs	water	TCEQ SOP, V1	61
Days since precipitation event	days	water	TCEQ SOP V1	72053
Flow measurement method	1-gage 2-electric 3-mechanical 4-weir/flume 5-doppler	water	TCEQ SOP, V1	89835
Flow severity	1-no flow 2-low 3-normal 4-flood 5-high 6-dry	water	TCEQ SOP, V1	1351
Flow Estimate	cfs	water	TCEQ SOP, V1	74069
Maximum pool width at time of study[1]	meters	other	TCEQ IGD	89864
Maximum pool depth at time of study[1]	meters	other	TCEQ IGD	89865
Pool length[1]	meters	other	TCEQ IGD	89869
% Pool coverage in 500-meter reach[1]	meters	other	TCEQ IGD	89870
Conventional and Bacteriological Parameters				
TSS	mg/L	water	SM 2540 - D	530
Chlorophyll-a, spectrophotometric method	µg/L	water	SM 10200 - H	32211
Pheophytin, spectrophotometric method	µg/L	water	SM 10200 - H	32218
E. coli, modified mTEC	CFU/100mL	water	EPA 1603[2]	31648
Total Kjeldahl Nitrogen	mg/L	water	SM 4500 – NH_3 G	625
Nitrate+Nitrite-N, total	mg/L	water	SM 4500 – NO_3 F	630
Total Phosphorus	mg/L	water	EPA 365.4	665

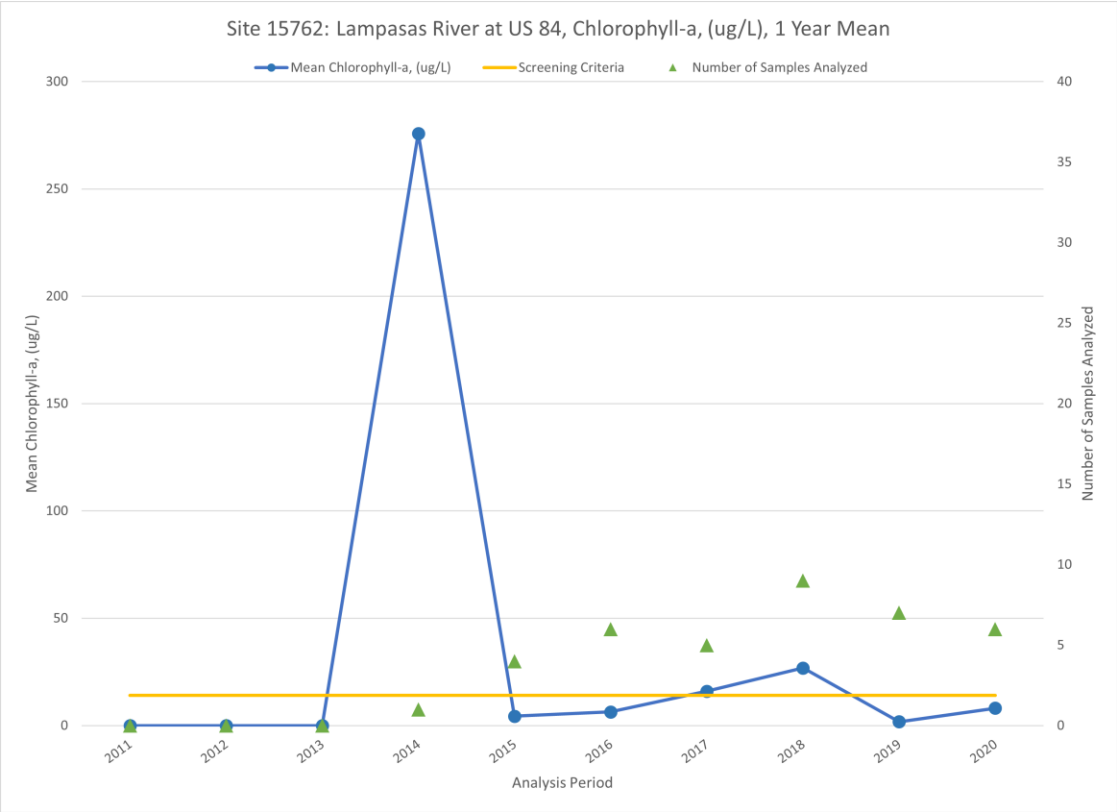
TCEQ Station ID	Monitoring Type																
	Routine Mainstem or Tributary Sample						Biased flow Sample						Total				
	Flow (cfs)		TP (mg/L)				Flow (cfs)		TP (mg/L)				Flow (cfs)		TP		
	N	Mean	N	Min	Max	Mean	N	Mean	N	Min	Max	Mean	N	Mean	N	Mean	TP % Change
Lampasas River at US 84	60	15	36	0.030	0.803	0.104	15	1044	14	0.030	0.412	0.140	75	221	50	0.114	35%
Lampasas River at Lampasas CR 2925	69	50	47	0.030	0.755	0.106	16	1408	15	0.064	0.709	0.214	85	306	62	0.132	103%
Lampasas River at FM 2313	100	82	61	0.013	0.361	0.080	16	1768	16	0.030	0.858	0.168	116	315	77	0.098	111%
Lampasas River at US 190	92	145	62	0.009	0.450	0.098	16	2135	15	0.030	0.753	0.181	108	440	77	0.114	85%
Lampasas River at HWY 195	101	221	62	0.020	0.358	0.077	16	2738	15	0.030	0.565	0.209	117	565	77	0.103	171%
Sulphur Creek at Naruna Rd	60	11	60	0.009	0.588	0.082	16	66	16	0.030	0.195	0.101	76	23	76	0.086	23%
Sulphur Creek at Lampasas CR 3010	72	30	60	0.030	0.821	0.185	16	136	15	0.119	0.357	0.201	88	49	75	0.188	9%
Sulphur Creek at Lampasas CR 3050	77	32	62	0.025	0.257	0.112	16	193	15	0.105	0.494	0.193	93	60	77	0.128	72%
Clear Creek at Oakalla Rd	74	7	63	0.030	1.081	0.279	16	143	16	0.112	0.550	0.205	90	31	79	0.264	-26%
Reese Creek at FM 2670	73	6	60	0.015	0.240	0.081	16	156	16	0.030	0.330	0.129	89	33	76	0.091	60%

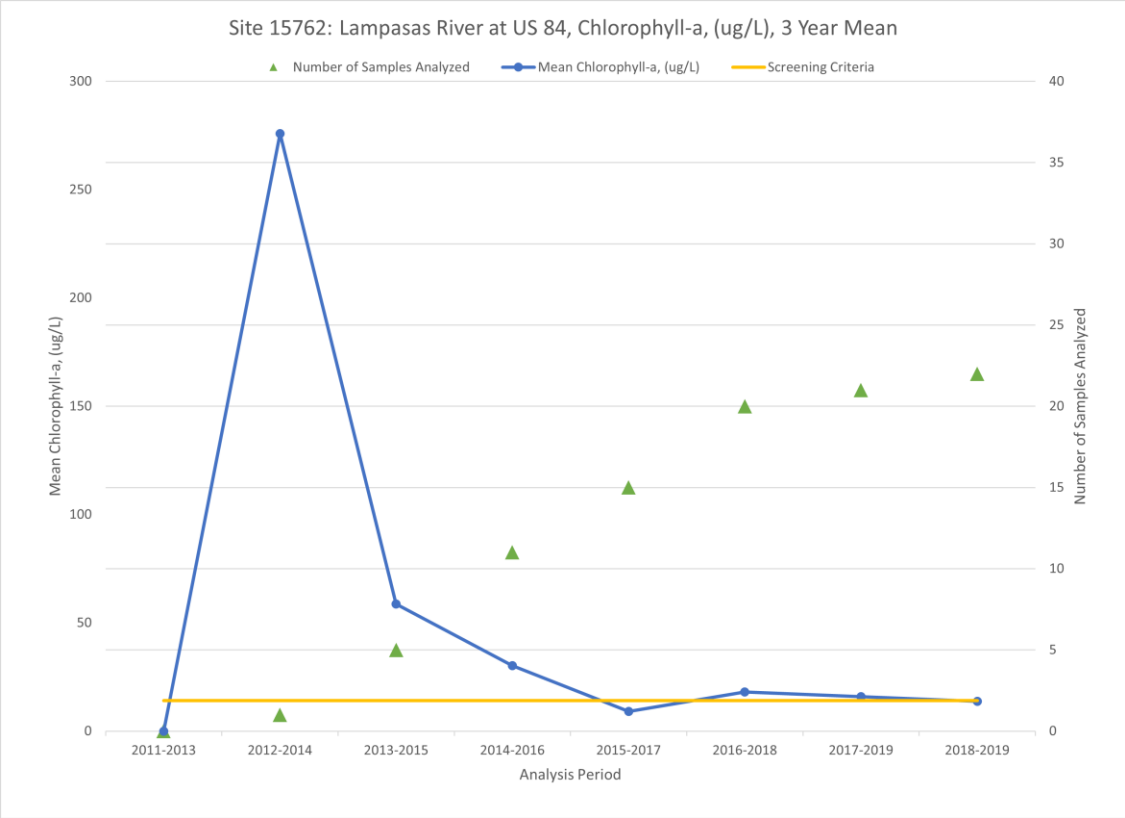
TCEQ Station ID	Monitoring Type																
	Routine Mainstem or Tributary Sample						Biased flow Sample						Total				
	Flow (cfs)		Total Nitrate+Nitrite-N (mg/L)				Flow (cfs)		Total Nitrate+Nitrite-N (mg/L)				Flow (cfs)		Total Nitrate+Nitrite-N (mg/L)		
	N	Mean	N	Min	Max	Mean	N	Mean	N	Min	Max	Mean	N	Mean	N	Mean	% Change
Lampasas River at US 84	60	15	37	0.007	1.082	0.256	15	1044	15	0.025	0.820	0.374	75	221	52	0.290	46%
Lampasas River at Lampasas CR 2925	69	50	43	0.007	1.856	0.280	16	1408	16	0.025	1.587	0.469	85	306	59	0.331	67%
Lampasas River at FM 2313	100	82	66	0.007	2.060	0.428	16	1768	16	0.066	0.891	0.406	116	315	82	0.424	-5%
Lampasas River at US 190	92	145	57	0.007	1.177	0.257	16	2135	16	0.109	0.769	0.420	108	440	73	0.293	64%
Lampasas River at HWY 195	101	221	63	0.007	0.974	0.227	16	2738	16	0.059	0.852	0.365	117	565	79	0.255	61%
Sulphur Creek at Naruna Rd	60	11	60	0.014	0.820	0.157	16	66	16	0.025	0.479	0.156	76	23	76	0.157	-1%
Sulphur Creek at Lampasas CR 3010	72	30	60	0.025	2.544	0.993	16	136	15	0.381	1.288	0.854	88	49	75	0.965	-14%
Sulphur Creek at Lampasas CR 3050	77	32	58	0.007	1.210	0.336	16	193	16	0.098	1.174	0.669	93	60	74	0.408	99%
Clear Creek at Oakalla Rd	74	7	58	0.007	4.402	0.611	16	143	16	0.337	1.193	0.715	90	31	74	0.634	17%
Reese Creek at FM 2670	73	6	59	0.007	0.619	0.194	16	156	16	0.025	0.410	0.298	89	33	75	0.216	54%

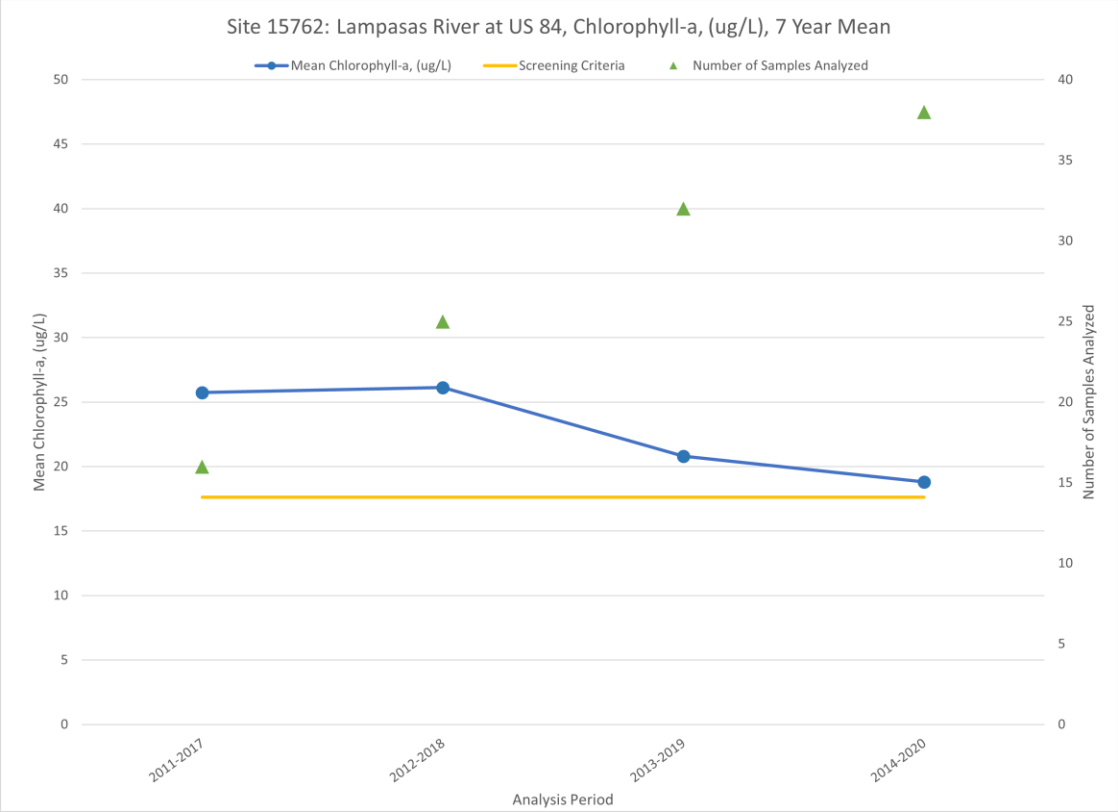
TCEQ Station ID	Monitoring Type																
	Routine Mainstem or Tributary Sample						Biased flow Sample						Total				
	Flow (cfs)		Total Kjeldahl Nitrogen (mg/L)				Flow (cfs)		Total Kjeldahl Nitrogen (mg/L)				Flow (cfs)		Total Kjeldahl Nitrogen (mg/L)		
	N	Mean	N	Min	Max	Mean	N	Mean	N	Min	Max	Mean	N	Mean	N	Mean	% Change
Lampasas River at US 84	60	15	36	0.067	3.839	0.827	15	1044	14	0.067	1.910	0.766	75	221	50	0.810	-7%
Lampasas River at Lampasas CR 2925	69	50	49	0.067	2.415	0.693	16	1408	15	0.067	2.709	1.029	85	306	64	0.771	49%
Lampasas River at FM 2313	100	82	75	0.067	1.172	0.331	16	1768	16	0.067	3.173	0.683	116	315	91	0.393	106%
Lampasas River at US 190	92	145	67	0.067	1.740	0.429	16	2135	15	0.067	2.548	0.850	108	440	82	0.506	98%
Lampasas River at HWY 195	101	221	72	0.067	1.746	0.395	16	2738	15	0.067	2.915	0.994	117	565	87	0.499	151%
Sulphur Creek at Naruna Rd	60	11	59	0.067	1.020	0.360	16	66	16	0.067	1.568	0.437	76	23	75	0.376	21%
Sulphur Creek at Lampasas CR 3010	72	30	59	0.067	1.502	0.389	16	136	15	0.067	1.300	0.531	88	49	74	0.418	36%
Sulphur Creek at Lampasas CR 3050	77	32	66	0.067	6.555	0.496	16	193	15	0.067	1.789	0.684	93	60	81	0.531	38%
Clear Creek at Oakalla Rd	74	7	60	0.067	1.867	0.501	16	143	16	0.067	1.238	0.592	90	31	76	0.520	18%
Reese Creek at FM 2670	73	6	59	0.067	1.993	0.315	16	156	16	0.067	1.297	0.618	89	33	75	0.380	96%

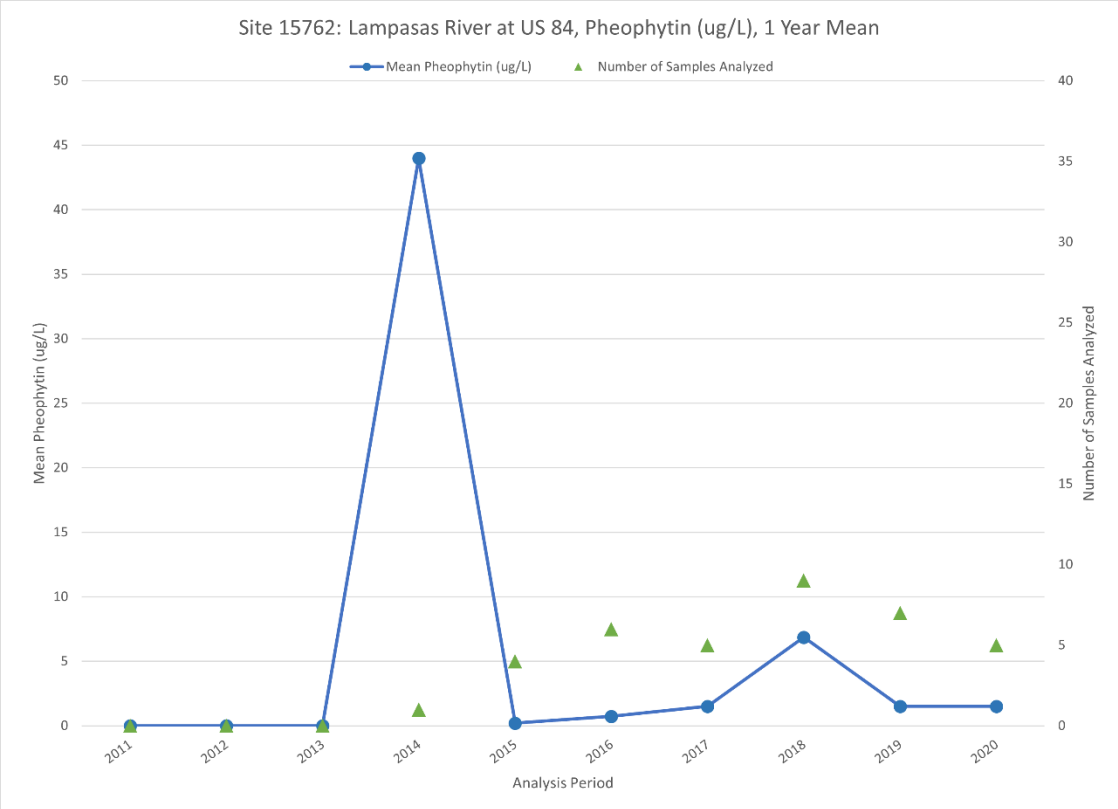
TCEQ Station ID	Monitoring Type																
	Routine Mainstem or Tributary Sample						Biased flow Sample						Total				
	Flow (cfs)		Chlorophyll-a, (ug/L)				Flow (cfs)		Chlorophyll-a, (ug/L)				Flow (cfs)		Chlorophyll-a, (ug/L)		
	N	Mean	N	Min	Max	Mean	N	Mean	N	Min	Max	Mean	N	Mean	N	Mean	% Change
Lampasas River at US 84	60	15	38	0.600	275.900	18.802	15	1044	12	1.400	10.600	4.158	75	221	50	15.287	-78%
Lampasas River at Lampasas CR 2925	69	50	45	1.500	136.200	10.736	16	1408	10	1.500	22.300	7.216	85	306	55	10.096	-33%
Lampasas River at FM 2313	100	82	57	0.300	28.800	3.409	16	1768	11	1.500	18.300	6.733	116	315	68	3.947	98%
Lampasas River at US 190	92	145	53	0.900	16.100	3.452	16	2135	11	3.600	14.800	8.399	108	440	64	4.303	143%
Lampasas River at HWY 195	101	221	53	0.700	22.300	2.390	16	2738	10	1.500	25.200	8.974	117	565	63	3.435	275%
Sulphur Creek at Naruna Rd	60	11	59	0.800	57.700	8.747	16	66	13	1.500	12.400	6.133	76	23	72	8.275	-30%
Sulphur Creek at Lampasas CR 3010	72	30	57	1.300	7.300	2.504	16	136	11	0.800	13.000	3.593	88	49	68	2.680	43%
Sulphur Creek at Lampasas CR 3050	77	32	55	1.200	27.300	3.671	16	193	11	1.300	10.800	5.452	93	60	66	3.967	49%
Clear Creek at Oakalla Rd	74	7	58	0.300	147.000	7.937	16	143	10	0.300	7.900	2.580	90	31	68	7.150	-67%
Reese Creek at FM 2670	73	6	56	0.300	51.800	2.984	16	156	10	0.300	9.700	2.616	89	33	66	2.928	-12%

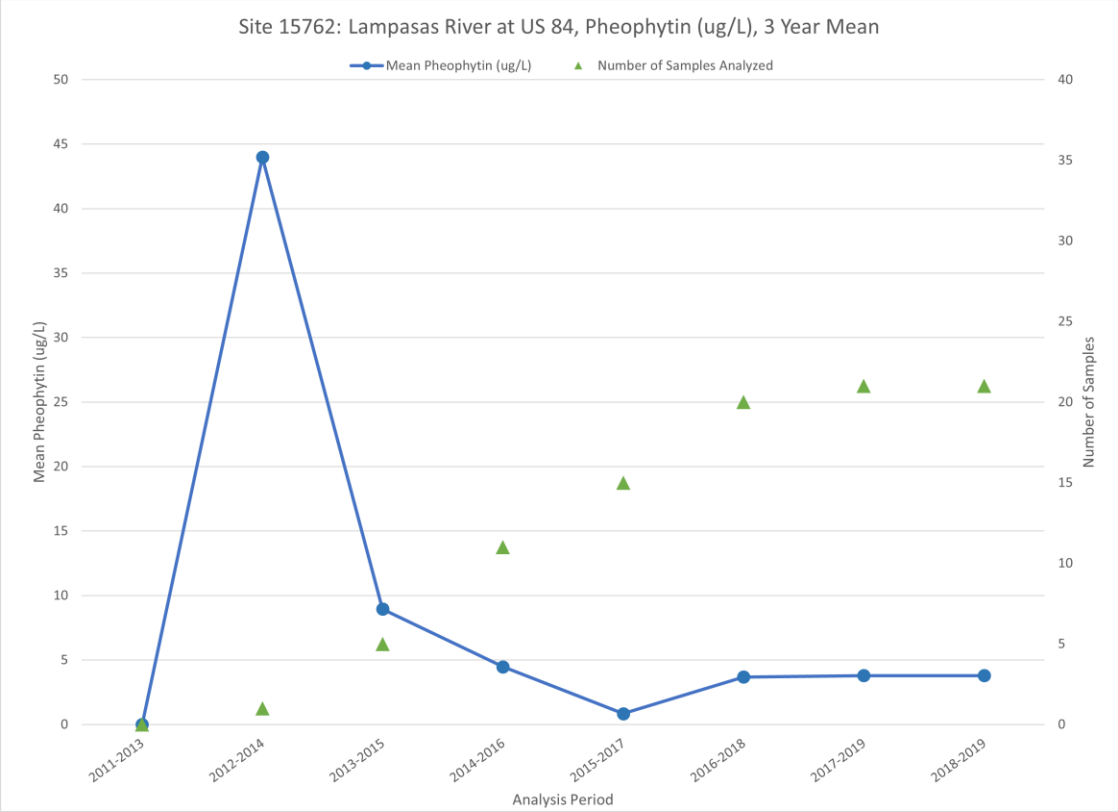
STATION 15762: LAMPASAS RIVER AT US 84

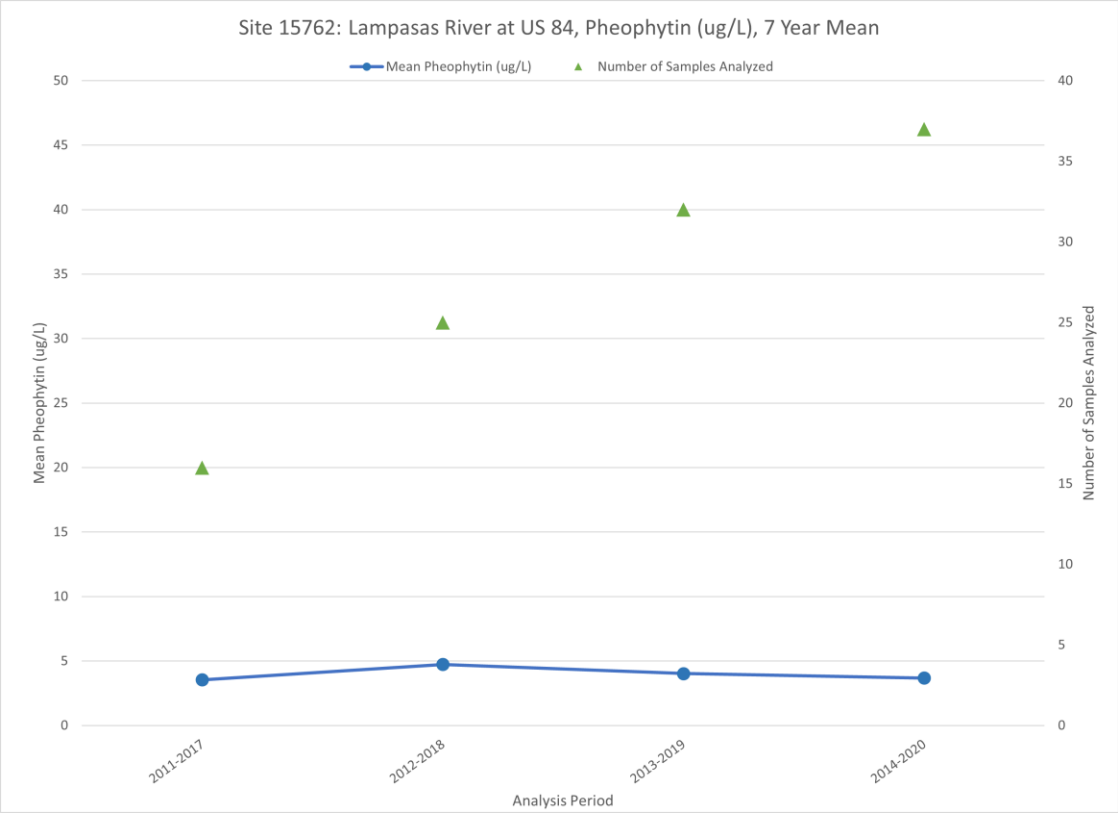


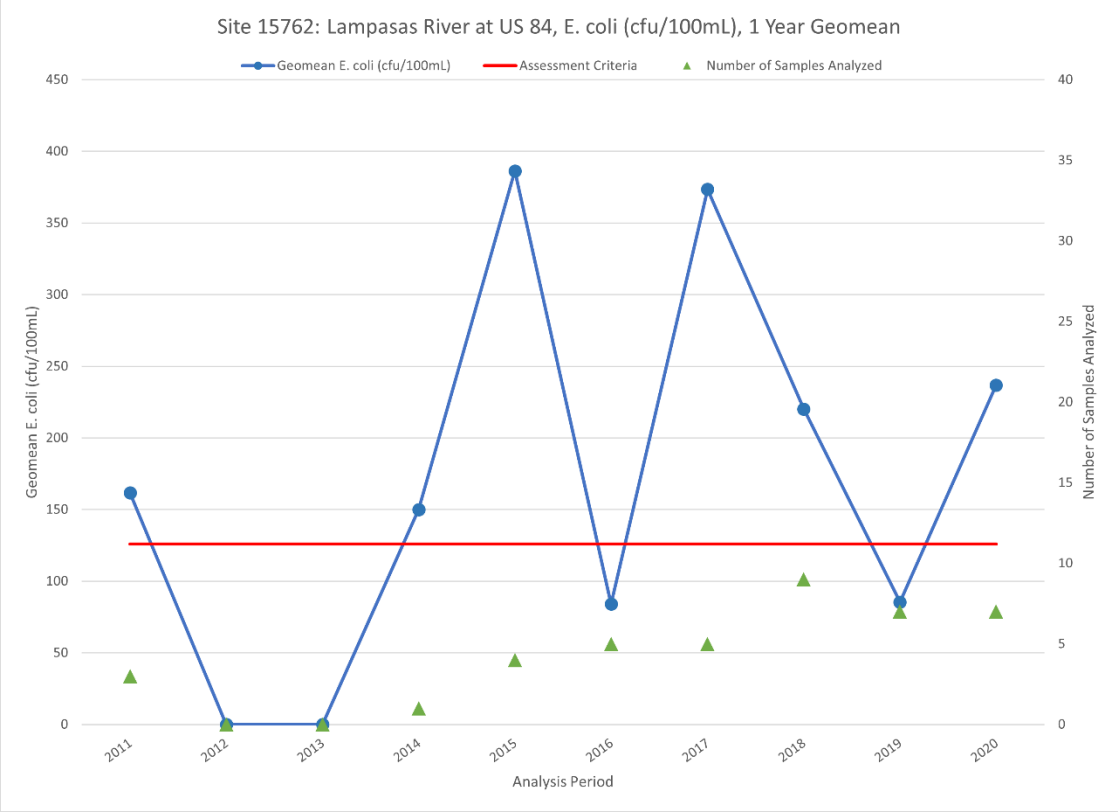


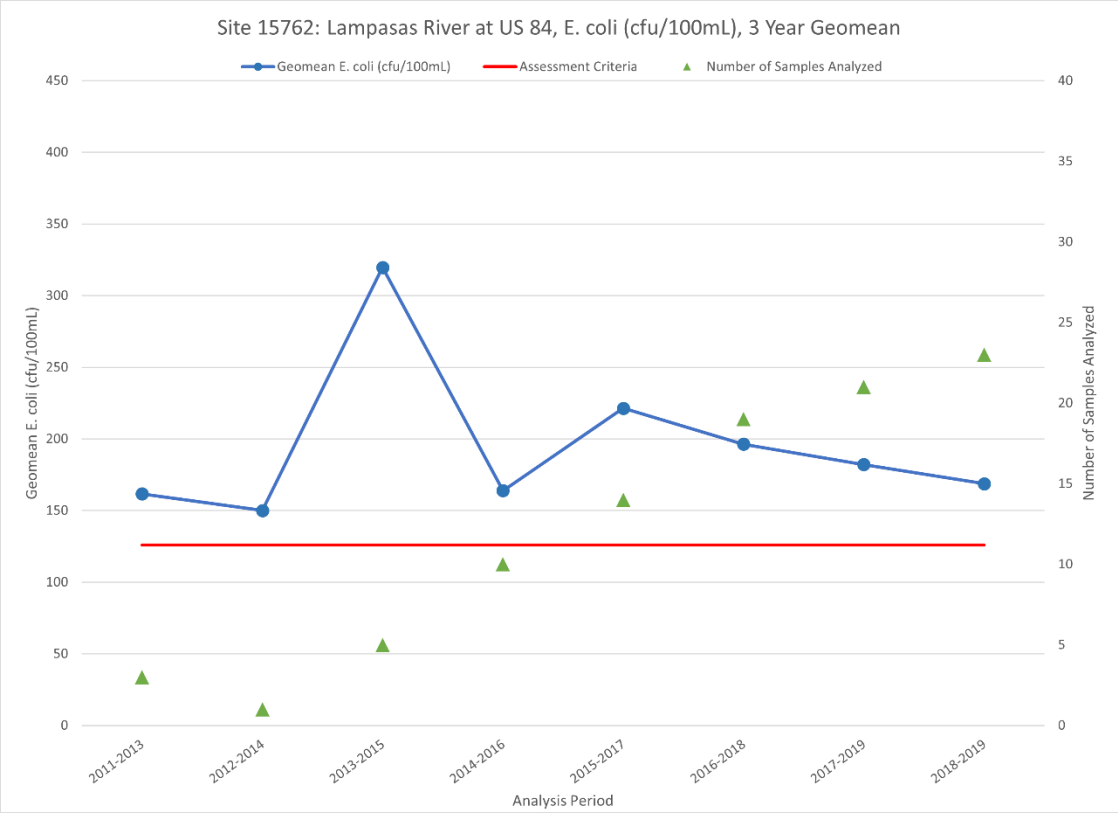

Site 15762: Lampasas River at US 84, Chlorophyll-a, (ug/L), 7 Year Mean
Mean Chlorophyll-a, (ug/L)
Screening Criteria
Number of Samples Analyzed
Mean Chlorophyll-a, (ug/L)
Number of Samples Analyzed
0
5
10
15
20
25
30
35
40
45
50
2011-2017
2012-2018
2013-2019
2014-2020
Analysis Period

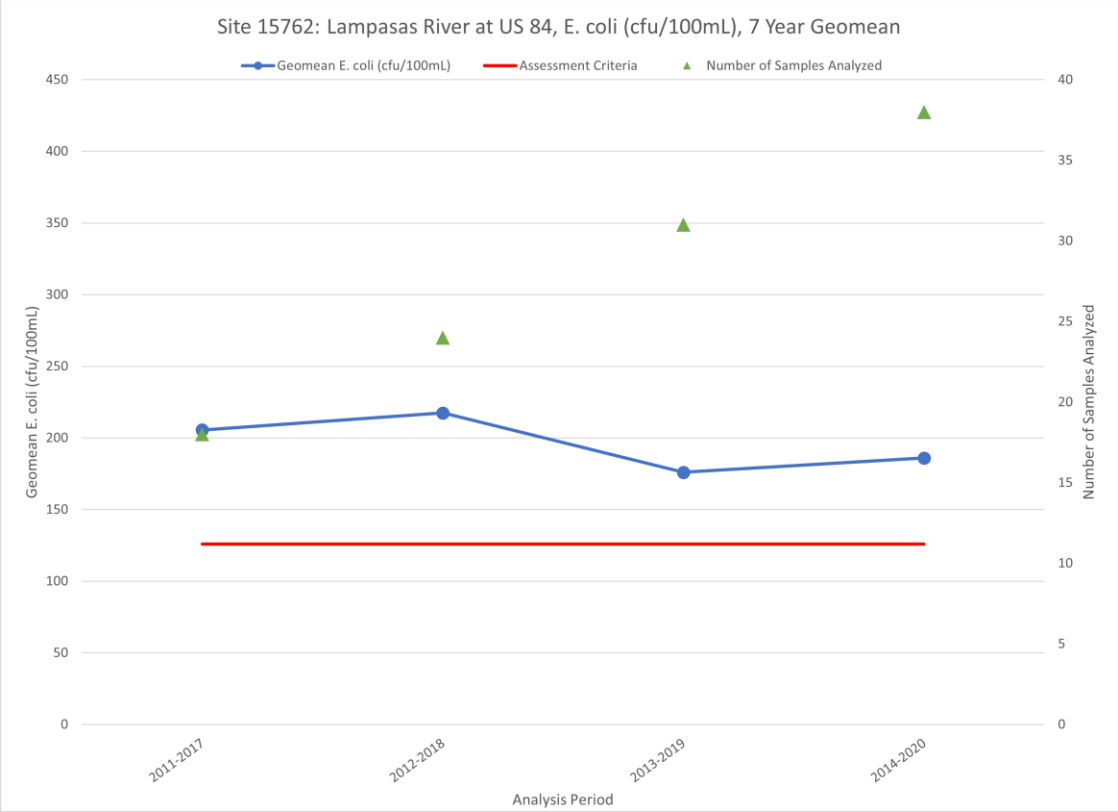

Site 15762: Lampasas River at US 84, Pheophytin (ug/L), 1 Year Mean
Mean Pheophytin (ug/L)
Number of Samples Analyzed
Mean Pheophytin (ug/L)
Number of Samples Analyzed
0
5
10
15
20
25
30
35
40
45
50
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Analysis Period

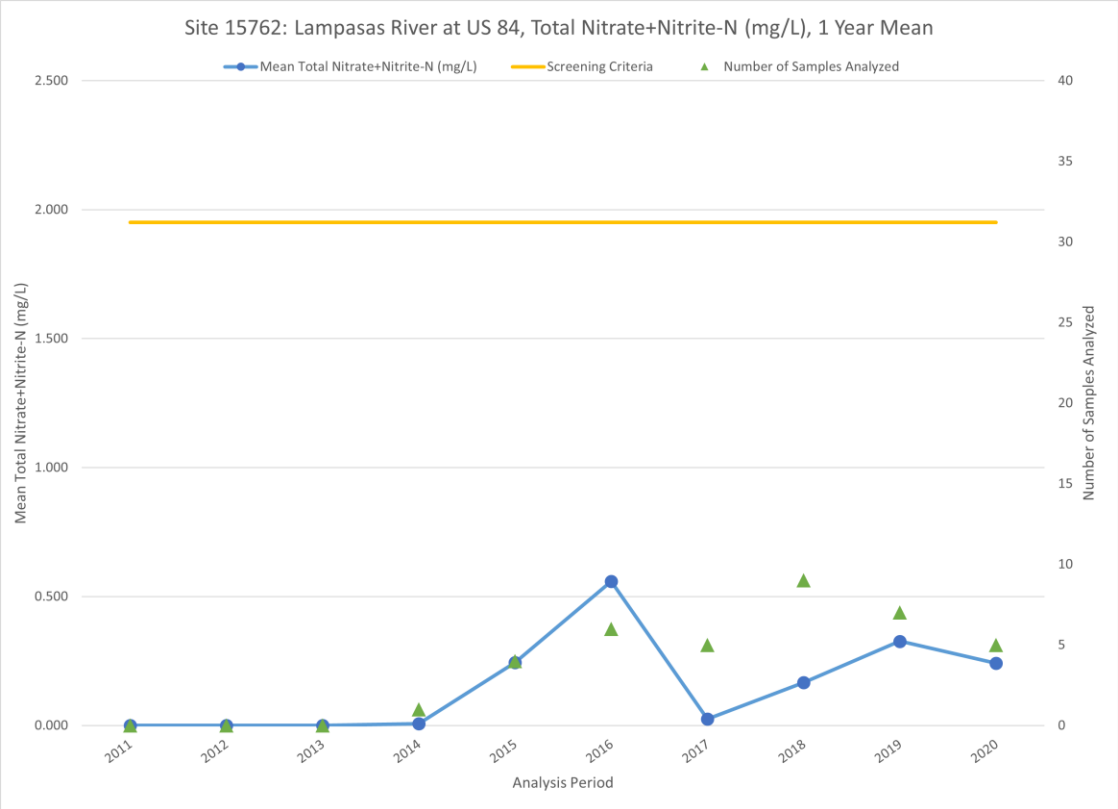

Site 15762: Lampasas River at US 84, Pheophytin (ug/L), 3 Year Mean
Mean Pheophytin (ug/L)
Number of Samples Analyzed
Mean Pheophytin (ug/L)
Number of Samples
Analysis Period
2011-2013
2012-2014
2013-2015
2014-2016
2015-2017
2016-2018
2017-2019
2018-2019

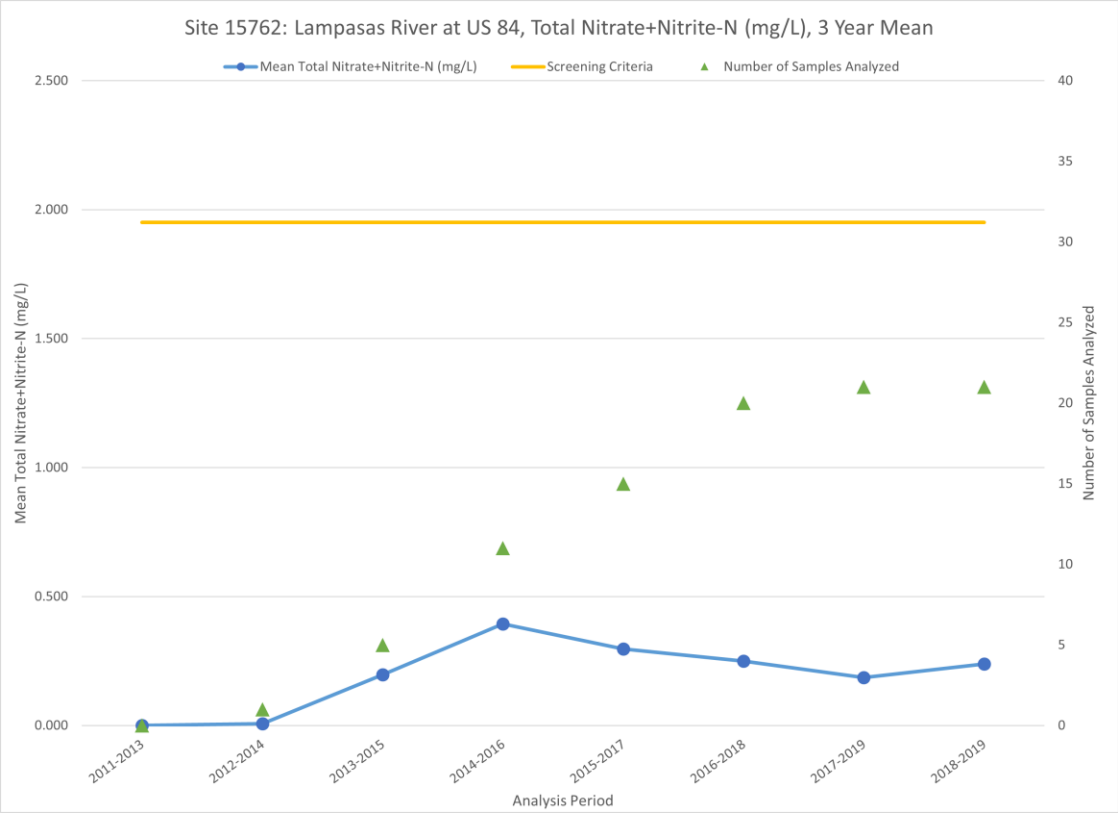

Site 15762: Lampasas River at US 84, Pheophytin (ug/L), 7 Year Mean
Mean Pheophytin (ug/L)
Number of Samples Analyzed
Mean Pheophytin (ug/L)
Number of Samples Analyzed
Analysis Period
2011-2017
2012-2018
2013-2019
2014-2020

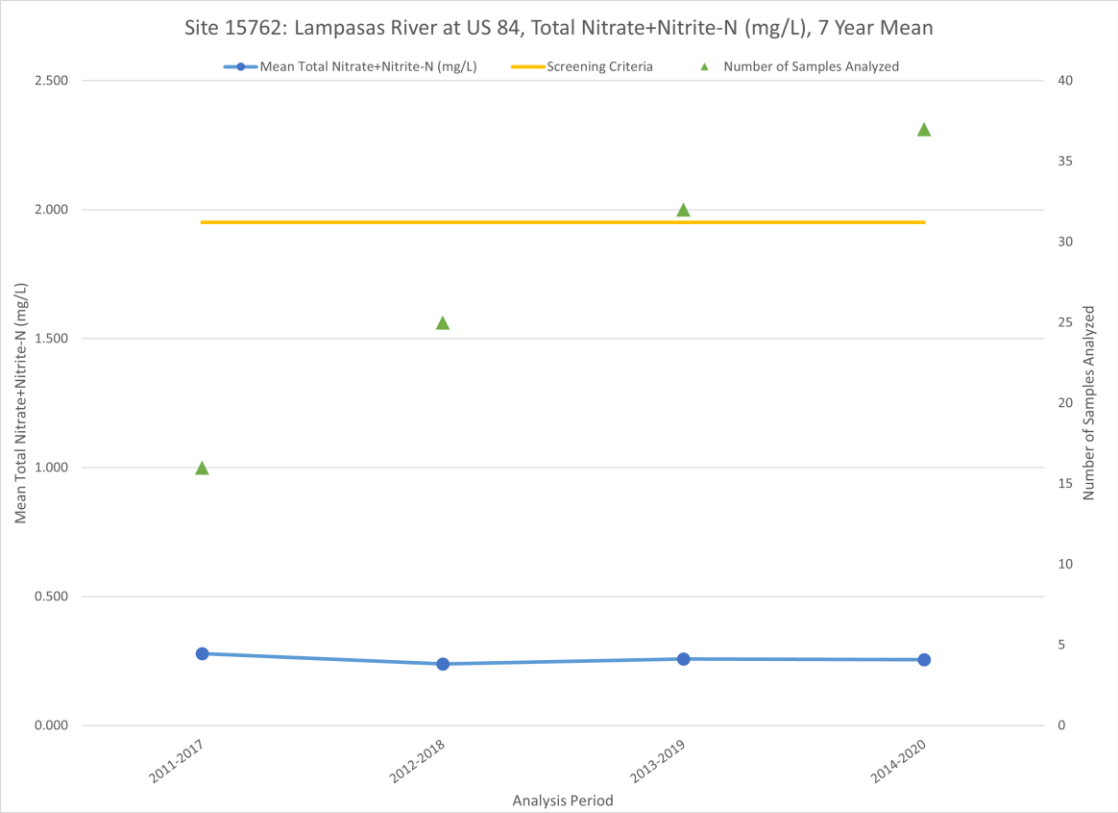

Site 15762: Lampasas River at US 84, E. coli (cfu/100mL), 1 Year Geomean
Geomean E. coli (cfu/100mL)
Assessment Criteria
Number of Samples Analyzed
Geomean E. coli (cfu/100mL)
Number of Samples Analyzed
Analysis Period
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

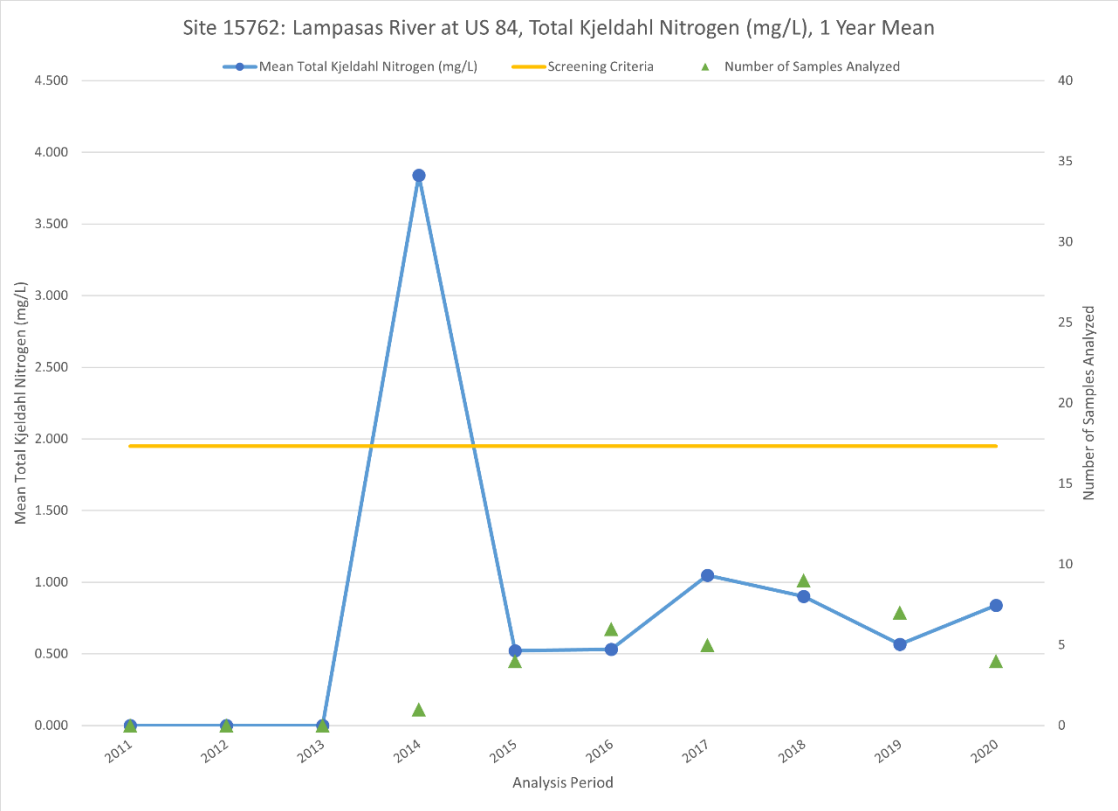

Site 15762: Lampasas River at US 84, E. coli (cfu/100mL), 3 Year Geomean
Geomean E. coli (cfu/100mL)
Assessment Criteria
Number of Samples Analyzed
Geomean E. coli (cfu/100mL)
Number of Samples Analyzed
Analysis Period
2011-2013
2012-2014
2013-2015
2014-2016
2015-2017
2016-2018
2017-2019
2018-2019

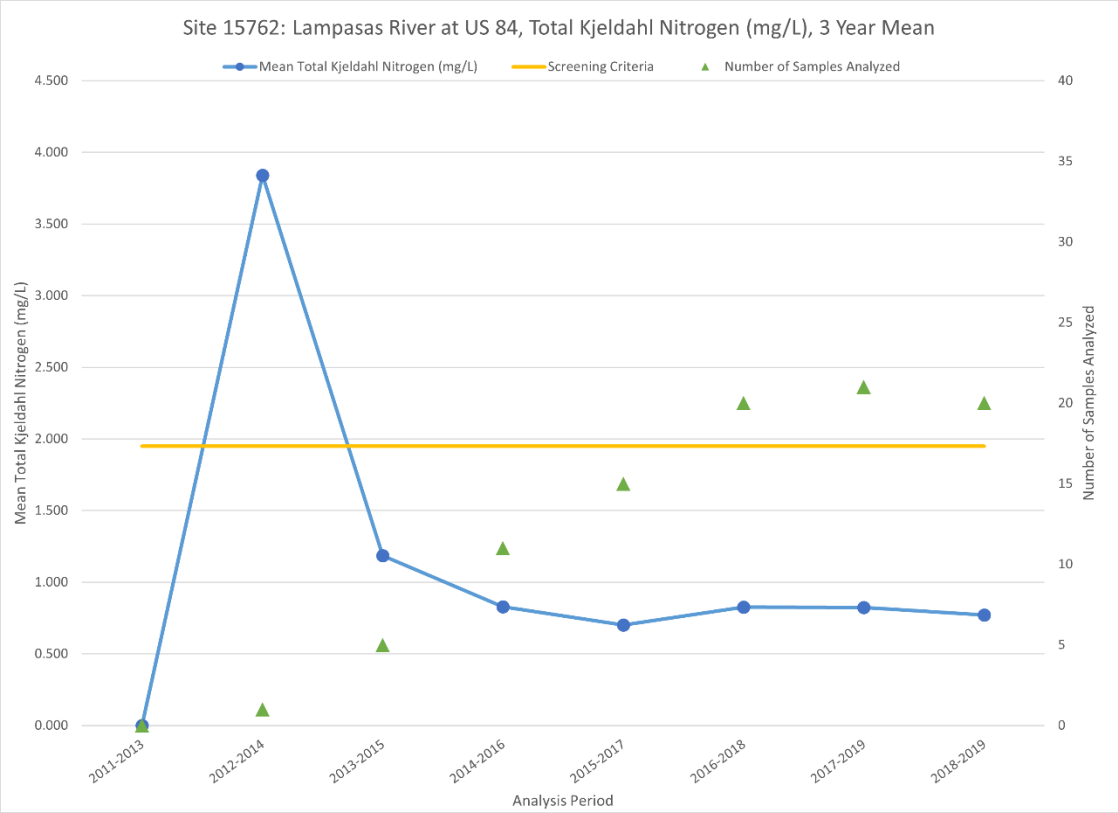

Site 15762: Lampasas River at US 84, E. coli (cfu/100mL), 7 Year Geomean
Geomean E. coli (cfu/100mL)
Assessment Criteria
Number of Samples Analyzed
Geomean E. coli (cfu/100mL)
Number of Samples Analyzed
Analysis Period
2011-2017
2012-2018
2013-2019
2014-2020

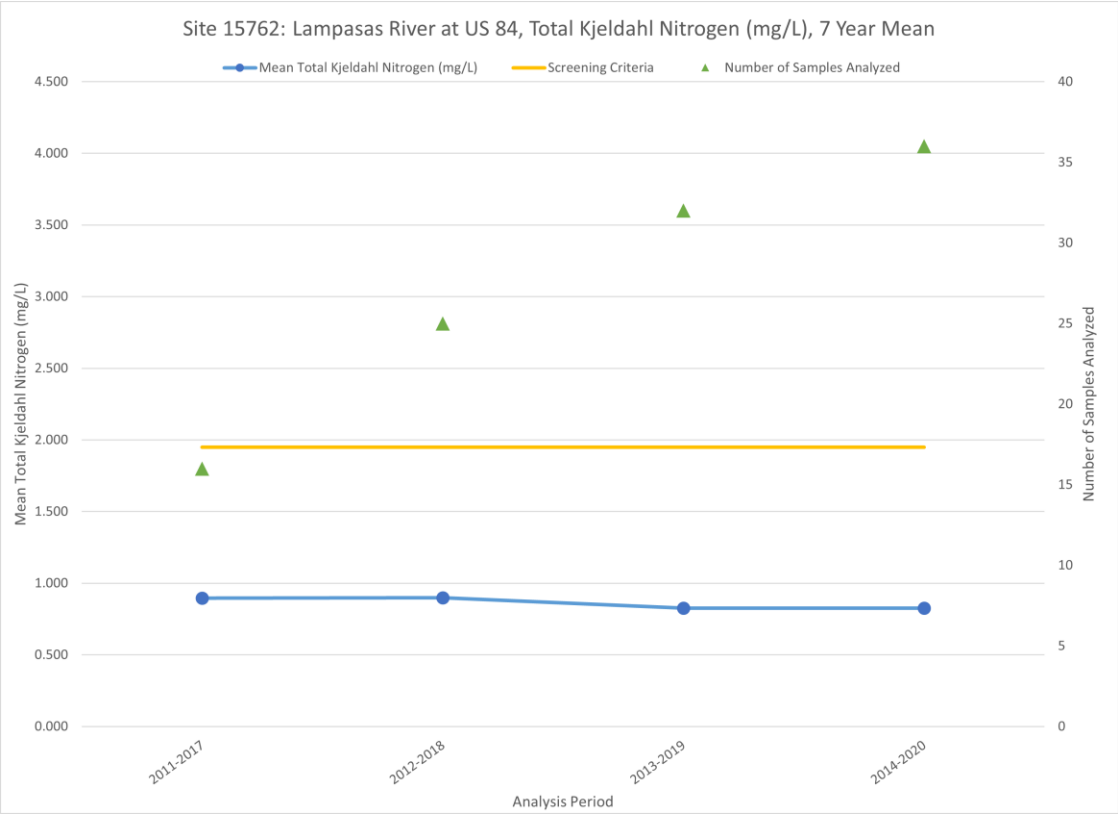

Site 15762: Lampasas River at US 84, Total Nitrate+Nitrite-N (mg/L), 1 Year Mean
Mean Total Nitrate+Nitrite-N (mg/L)
Screening Criteria
Number of Samples Analyzed
Mean Total Nitrate+Nitrite-N (mg/L)
Number of Samples Analyzed
Analysis Period


Site 15762: Lampasas River at US 84, Total Nitrate+Nitrite-N (mg/L), 3 Year Mean
Mean Total Nitrate+Nitrite-N (mg/L)
Screening Criteria
Number of Samples Analyzed
Mean Total Nitrate+Nitrite-N (mg/L)
Number of Samples Analyzed
2.500
2.000
1.500
1.000
0.500
0.000
40
35
30
25
20
15
10
5
0
2011-2013
2012-2014
2013-2015
2014-2016
2015-2017
2016-2018
2017-2019
2018-2019
Analysis Period

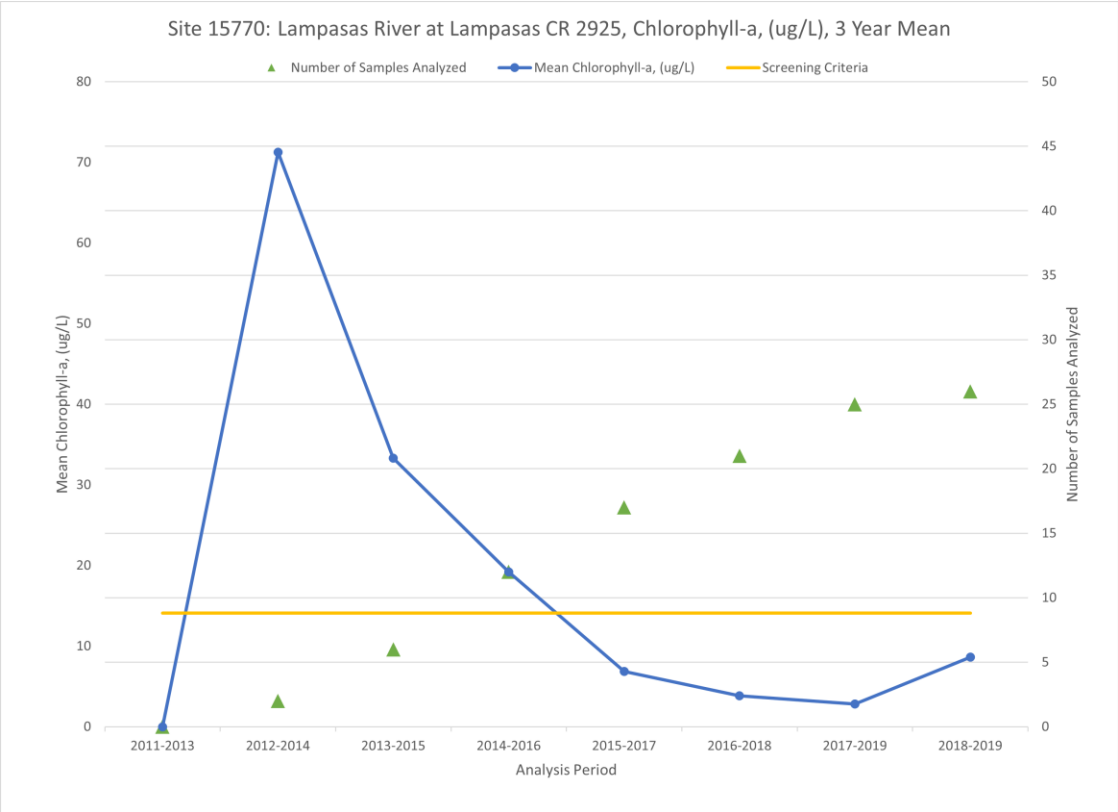

Site 15762: Lampasas River at US 84, Total Nitrate+Nitrite-N (mg/L), 7 Year Mean
Mean Total Nitrate+Nitrite-N (mg/L)
Screening Criteria
Number of Samples Analyzed
Mean Total Nitrate+Nitrite-N (mg/L)
Number of Samples Analyzed
2.500
2.000
1.500
1.000
0.500
0.000
40
35
30
25
20
15
10
5
0
2011-2017
2012-2018
2013-2019
2014-2020
Analysis Period

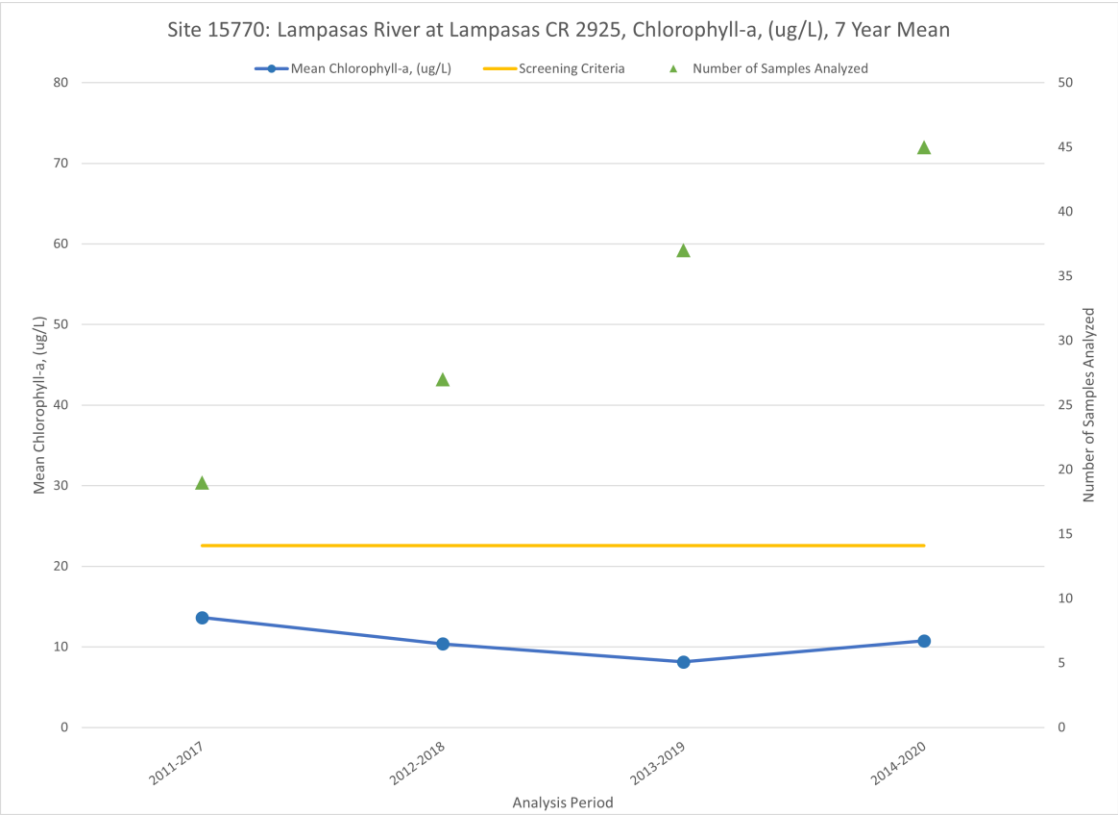

Site 15762: Lampasas River at US 84, Total Kjeldahl Nitrogen (mg/L), 1 Year Mean
Mean Total Kjeldahl Nitrogen (mg/L)
Screening Criteria
Number of Samples Analyzed
Mean Total Kjeldahl Nitrogen (mg/L)
Number of Samples Analyzed
Analysis Period
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

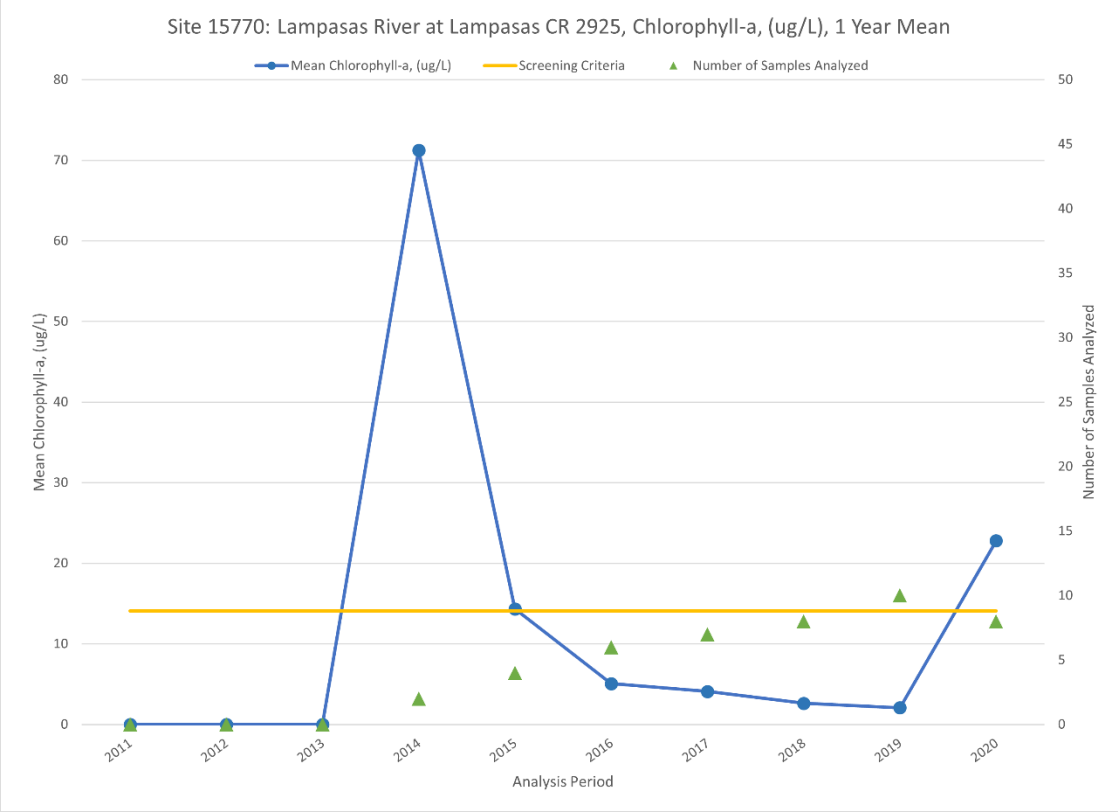

Site 15762: Lampasas River at US 84, Total Kjeldahl Nitrogen (mg/L), 3 Year Mean
Mean Total Kjeldahl Nitrogen (mg/L)
Screening Criteria
Number of Samples Analyzed
Mean Total Kjeldahl Nitrogen (mg/L)
Number of Samples Analyzed
Analysis Period
2011-2013
2012-2014
2013-2015
2014-2016
2015-2017
2016-2018
2017-2019
2018-2019

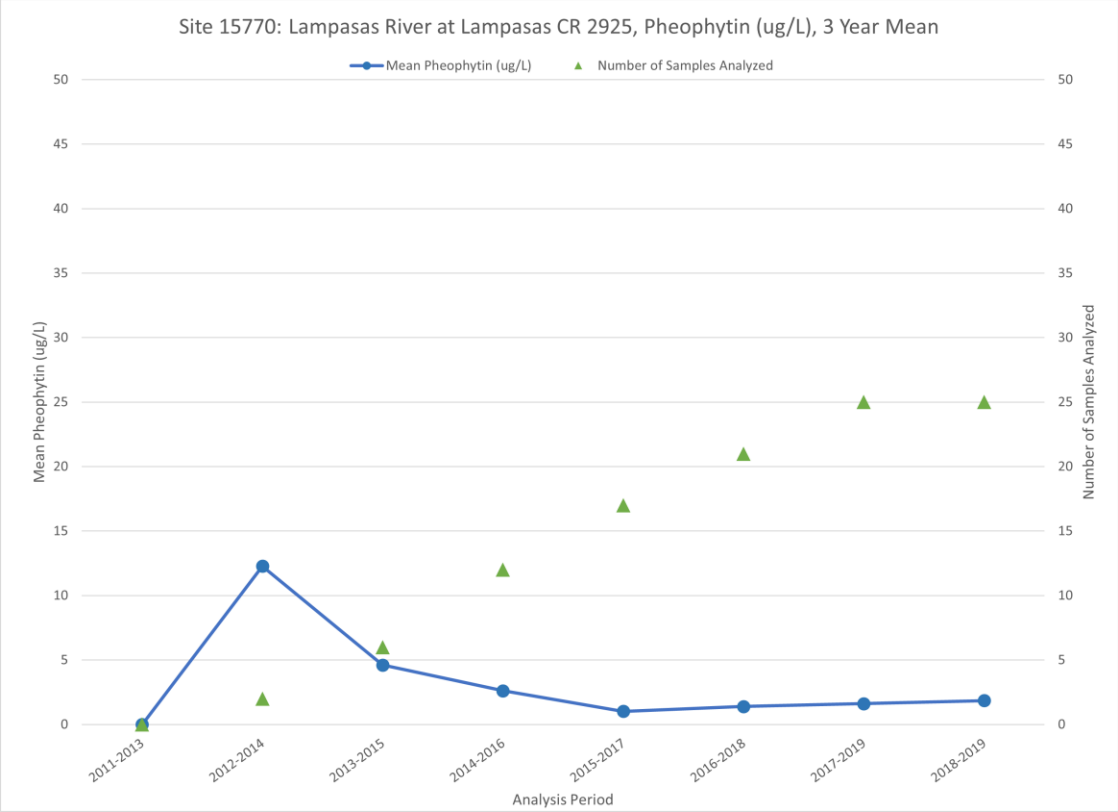

Site 15762: Lampasas River at US 84, Total Kjeldahl Nitrogen (mg/L), 7 Year Mean
Mean Total Kjeldahl Nitrogen (mg/L)
Screening Criteria
Number of Samples Analyzed
4.500
4.000
3.500
3.000
2.500
2.000
1.500
1.000
0.500
0.000
40
35
30
25
20
15
10
5
0
2011-2017
2012-2018
2013-2019
2014-2020
Analysis Period

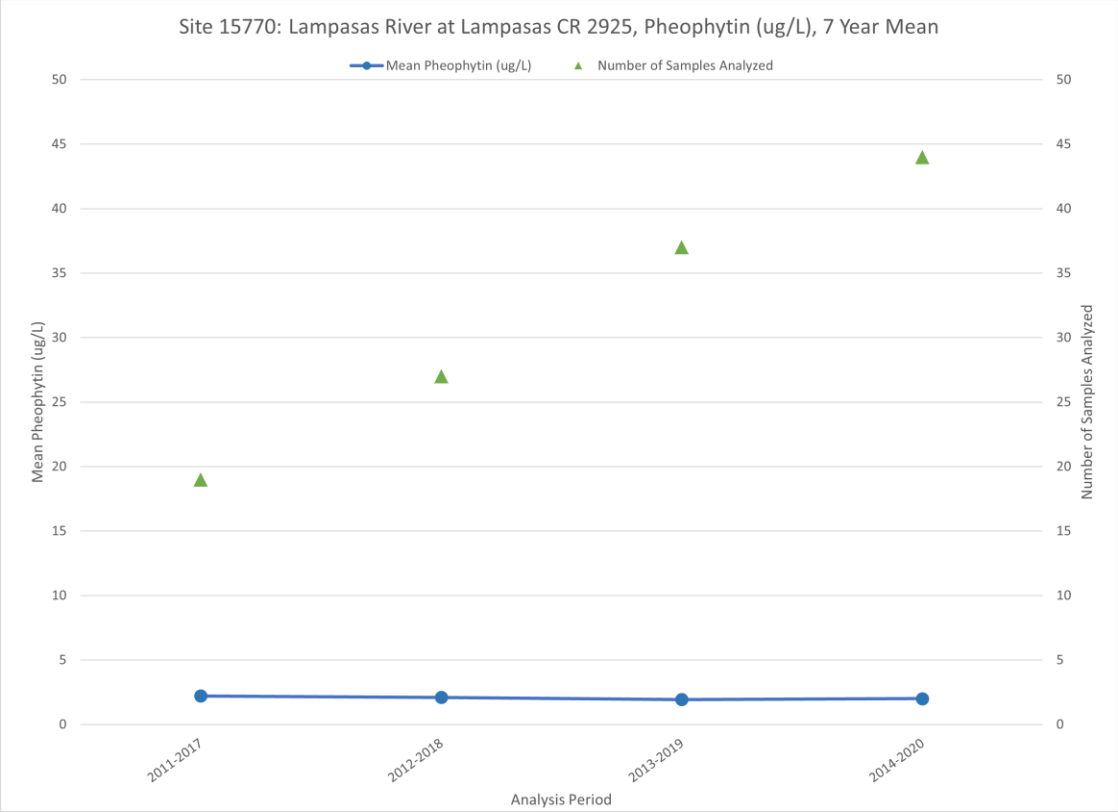
STATION 15770: LAMPASAS RIVER AT LAMPASAS CR 2925

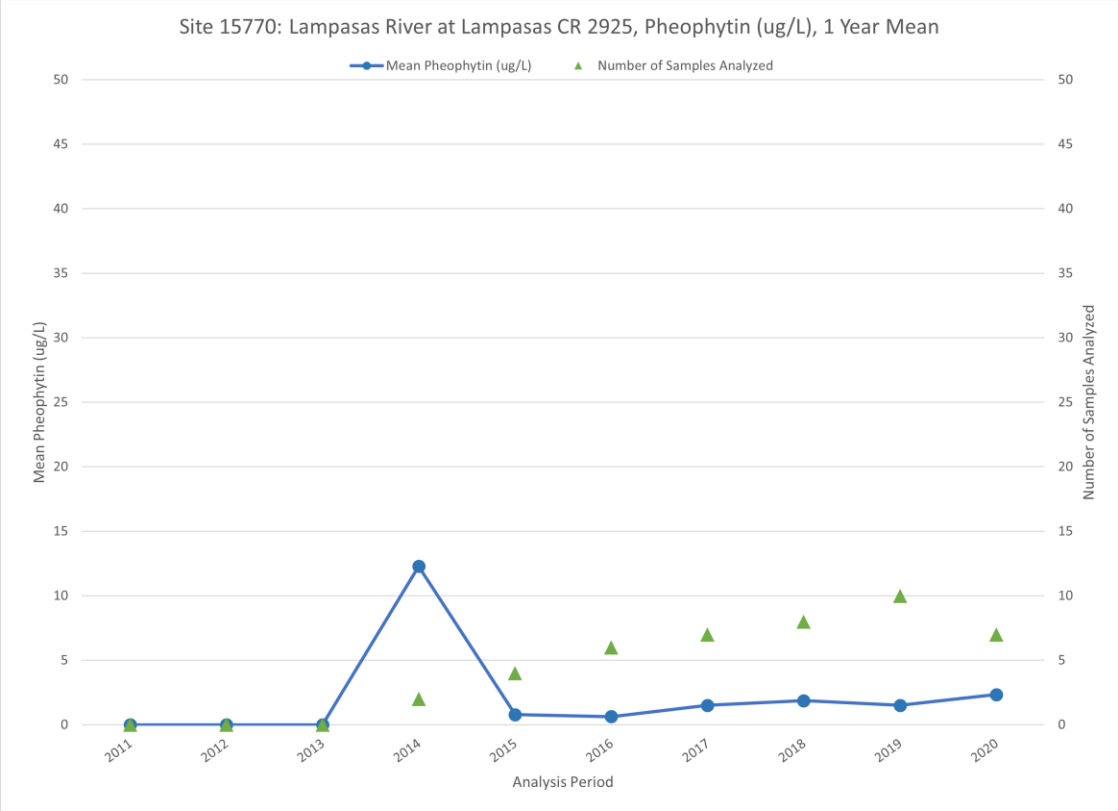


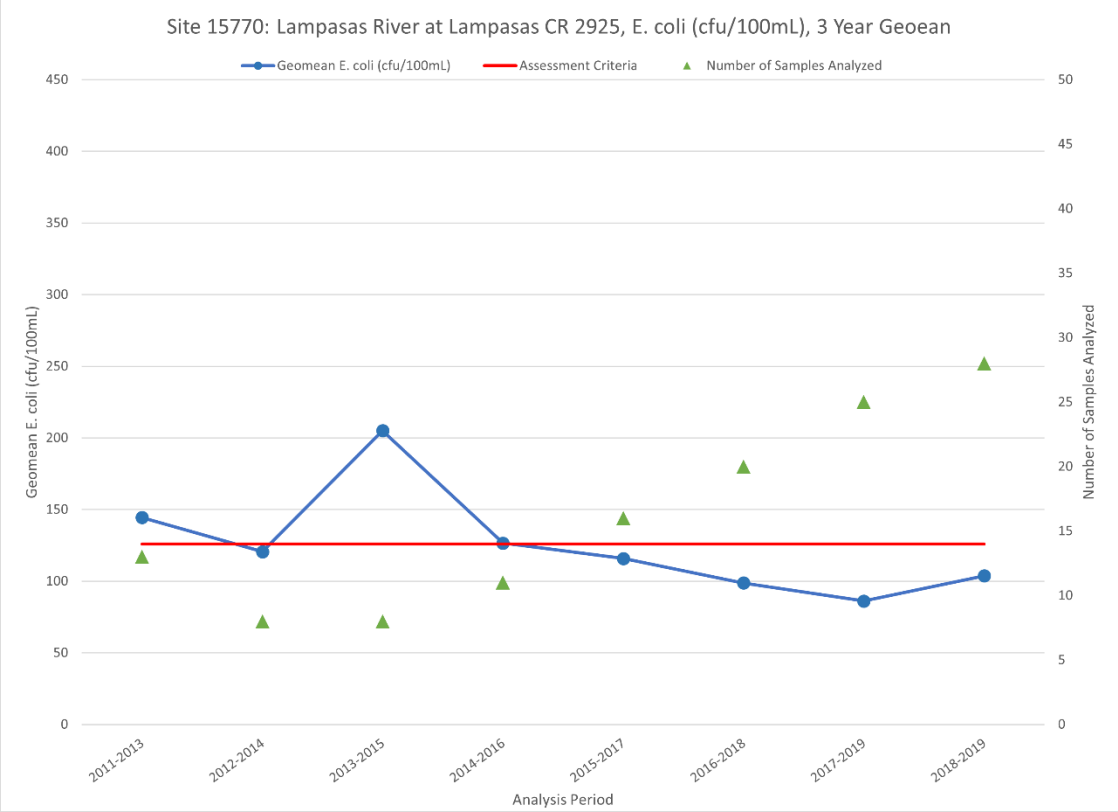


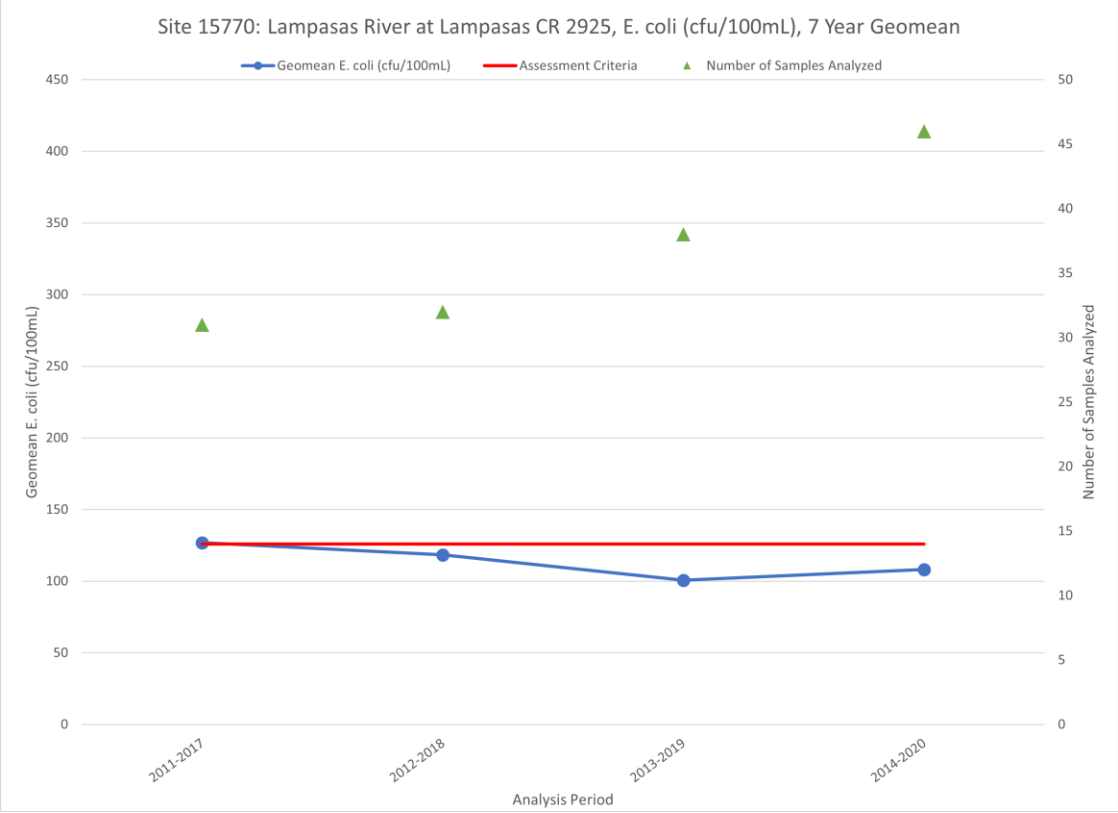

Site 15770: Lampasas River at Lampasas CR 2925, Chlorophyll-a, (ug/L), 1 Year Mean
Mean Chlorophyll-a, (ug/L)
Screening Criteria
Number of Samples Analyzed
Mean Chlorophyll-a, (ug/L)
Number of Samples Analyzed
Analysis Period
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

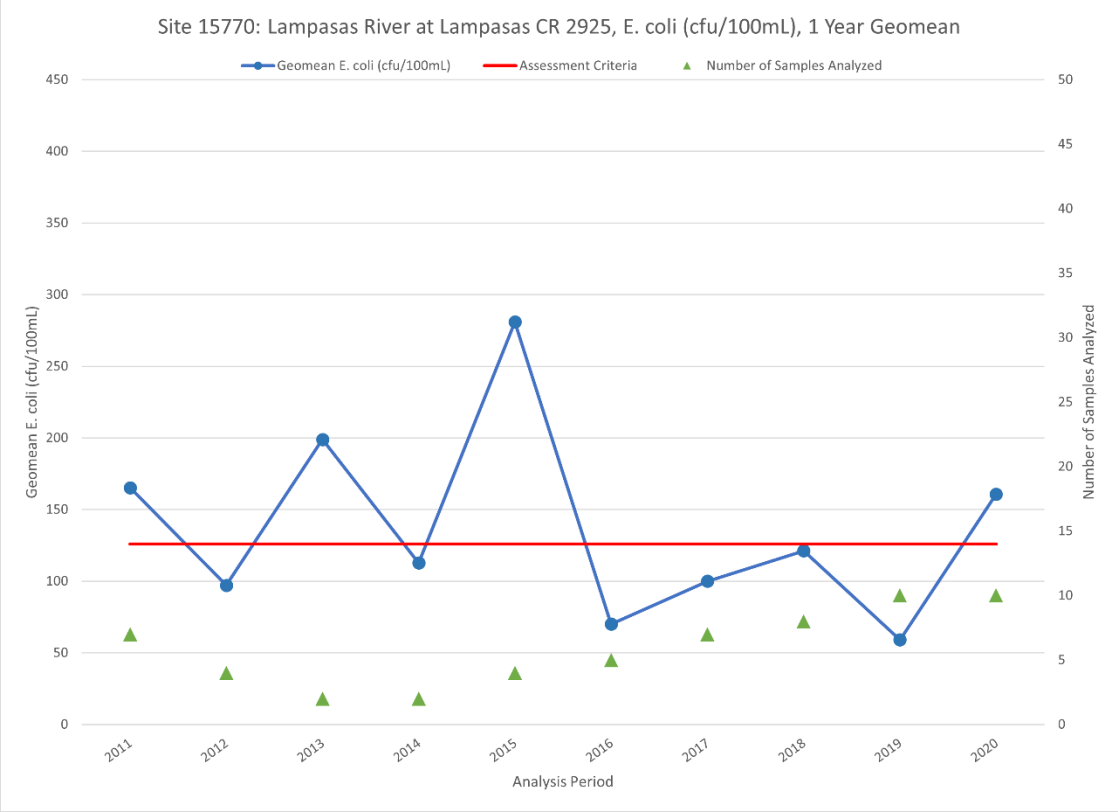

Site 15770: Lampasas River at Lampasas CR 2925, Pheophytin (ug/L), 3 Year Mean
Mean Pheophytin (ug/L)
Number of Samples Analyzed
Mean Pheophytin (ug/L)
Number of Samples Analyzed
Analysis Period
2011-2013
2012-2014
2013-2015
2014-2016
2015-2017
2016-2018
2017-2019
2018-2019

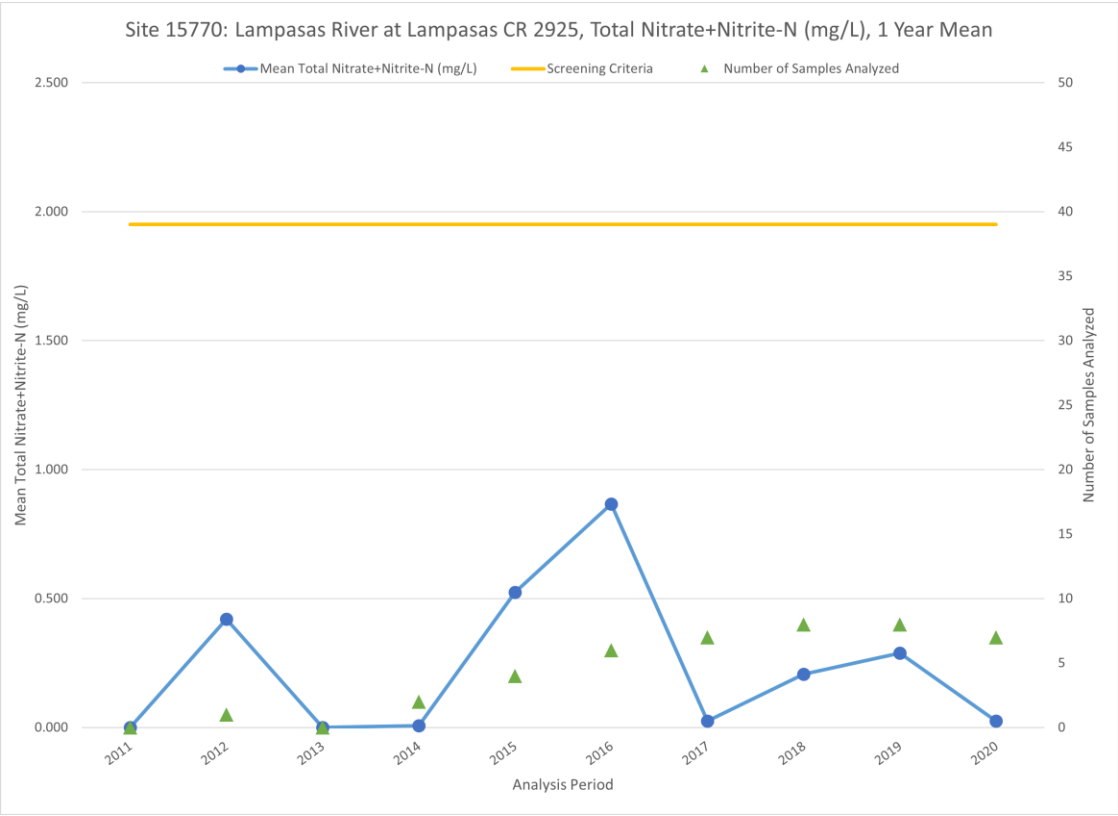

Site 15770: Lampasas River at Lampasas CR 2925, Pheophytin (ug/L), 7 Year Mean
Mean Pheophytin (ug/L)
Number of Samples Analyzed
Mean Pheophytin (ug/L)
Number of Samples Analyzed
0
5
10
15
20
25
30
35
40
45
50
2011-2017
2012-2018
2013-2019
2014-2020
Analysis Period

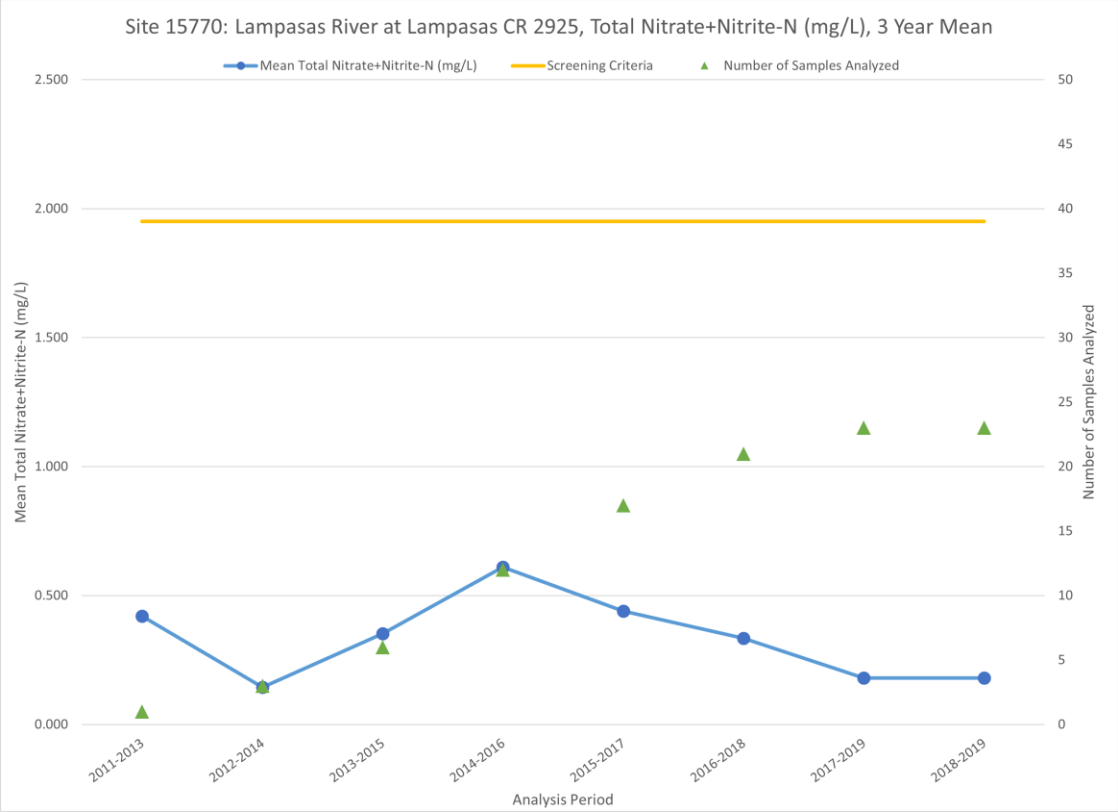

Site 15770: Lampasas River at Lampasas CR 2925, Pheophytin (ug/L), 1 Year Mean
Mean Pheophytin (ug/L)
Number of Samples Analyzed
Mean Pheophytin (ug/L)
Number of Samples Analyzed
0
5
10
15
20
25
30
35
40
45
50
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Analysis Period

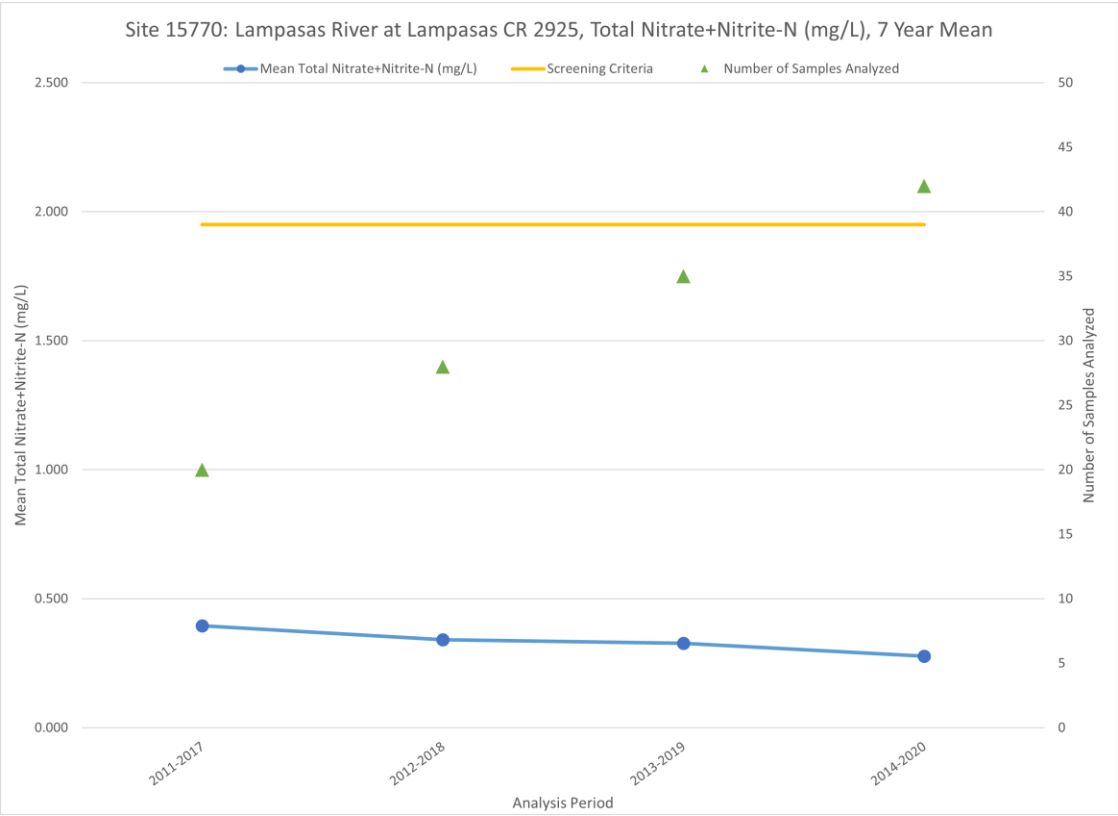

Site 15770: Lampasas River at Lampasas CR 2925, E. coli (cfu/100mL), 3 Year Geoean
Geomean E. coli (cfu/100mL)
Assessment Criteria
Number of Samples Analyzed
Geomean E. coli (cfu/100mL)
Number of Samples Analyzed
Analysis Period
2011-2013
2012-2014
2013-2015
2014-2016
2015-2017
2016-2018
2017-2019
2018-2019

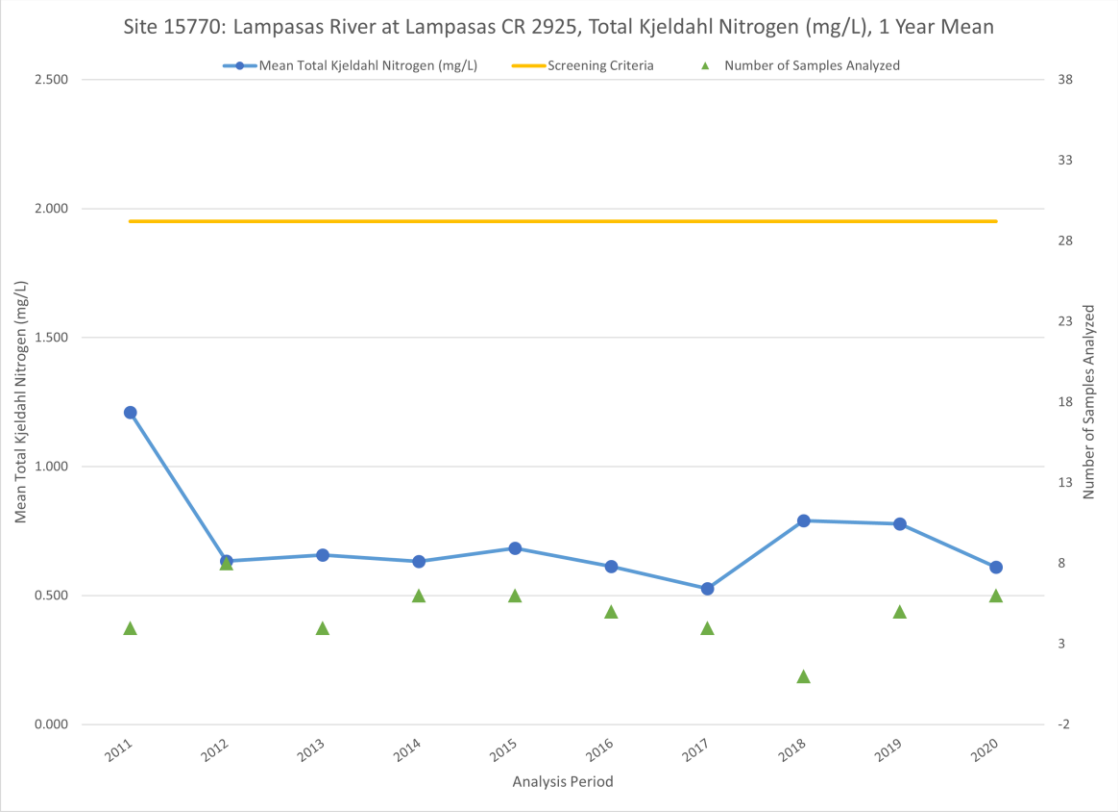

Site 15770: Lampasas River at Lampasas CR 2925, E. coli (cfu/100mL), 7 Year Geomean
Geomean E. coli (cfu/100mL)
Assessment Criteria
Number of Samples Analyzed
Geomean E. coli (cfu/100mL)
Number of Samples Analyzed
Analysis Period
2011-2017
2012-2018
2013-2019
2014-2020

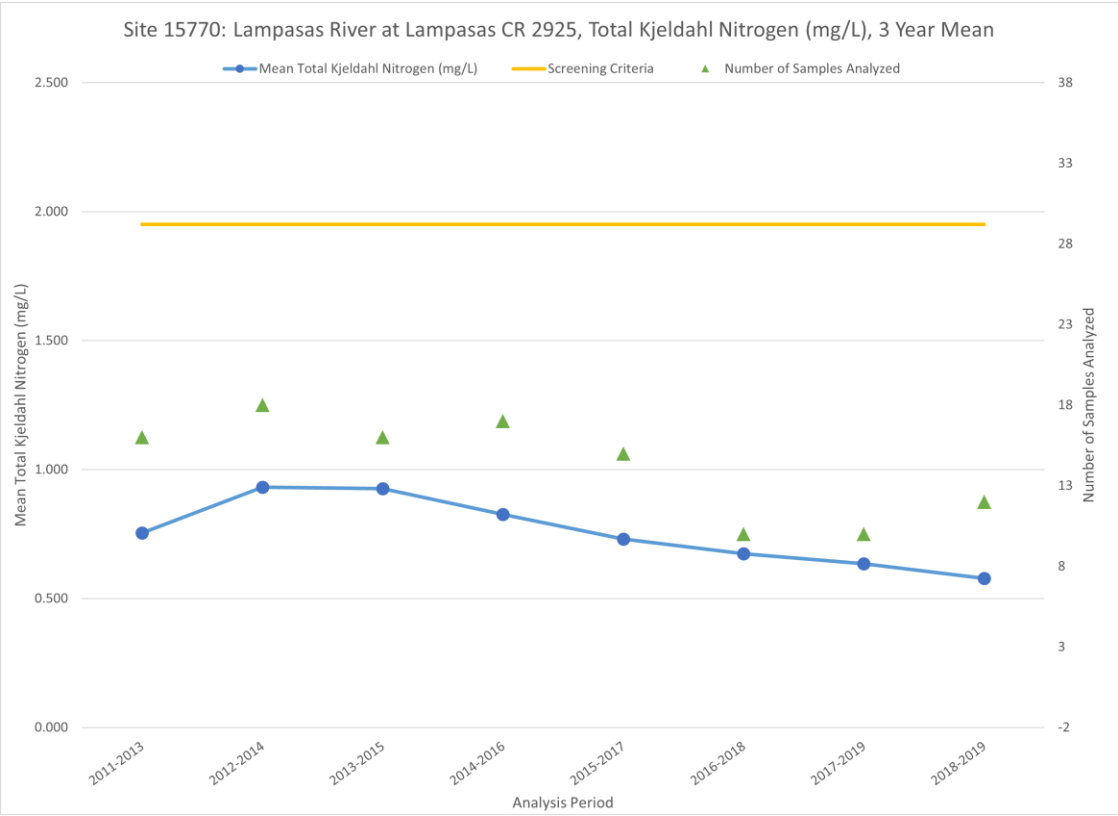

Site 15770: Lampasas River at Lampasas CR 2925, E. coli (cfu/100mL), 1 Year Geomean
Geomean E. coli (cfu/100mL)
Assessment Criteria
Number of Samples Analyzed
Geomean E. coli (cfu/100mL)
Number of Samples Analyzed
Analysis Period
0
50
100
150
200
250
300
350
400
450
0
5
10
15
20
25
30
35
40
45
50
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

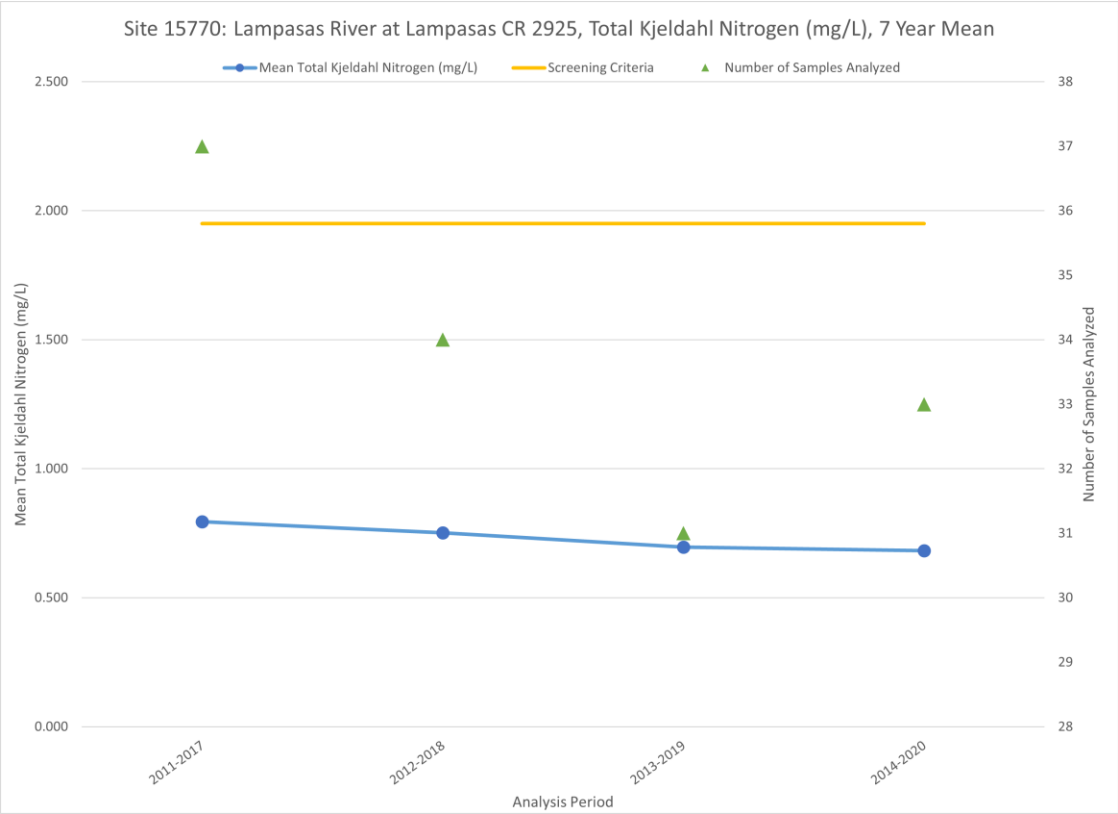

Site 15770: Lampasas River at Lampasas CR 2925, Total Nitrate+Nitrite-N (mg/L), 1 Year Mean
Mean Total Nitrate+Nitrite-N (mg/L)
Screening Criteria
Number of Samples Analyzed
Mean Total Nitrate+Nitrite-N (mg/L)
Number of Samples Analyzed
Analysis Period
0.000
0.500
1.000
1.500
2.000
2.500
0
5
10
15
20
25
30
35
40
45
50
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020


Site 15770: Lampasas River at Lampasas CR 2925, Total Nitrate+Nitrite-N (mg/L), 3 Year Mean
Mean Total Nitrate+Nitrite-N (mg/L)
Screening Criteria
Number of Samples Analyzed
2.500
2.000
1.500
1.000
0.500
0.000
50
45
40
35
30
25
20
15
10
5
0
Mean Total Nitrate+Nitrite-N (mg/L)
Number of Samples Analyzed
2011-2013
2012-2014
2013-2015
2014-2016
2015-2017
2016-2018
2017-2019
2018-2019
Analysis Period

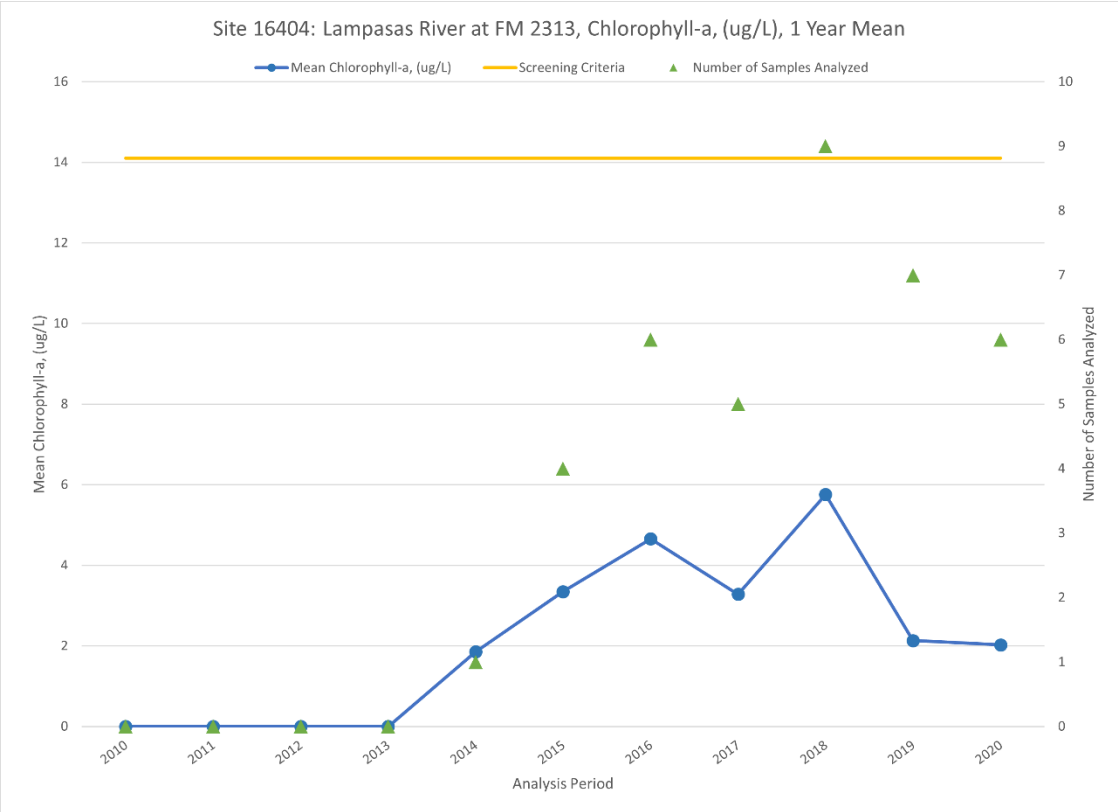

Site 15770: Lampasas River at Lampasas CR 2925, Total Nitrate+Nitrite-N (mg/L), 7 Year Mean
Mean Total Nitrate+Nitrite-N (mg/L)
Screening Criteria
Number of Samples Analyzed
2.500
2.000
1.500
1.000
0.500
0.000
50
45
40
35
30
25
20
15
10
5
0
Mean Total Nitrate+Nitrite-N (mg/L)
Number of Samples Analyzed
2011-2017
2012-2018
2013-2019
2014-2020
Analysis Period

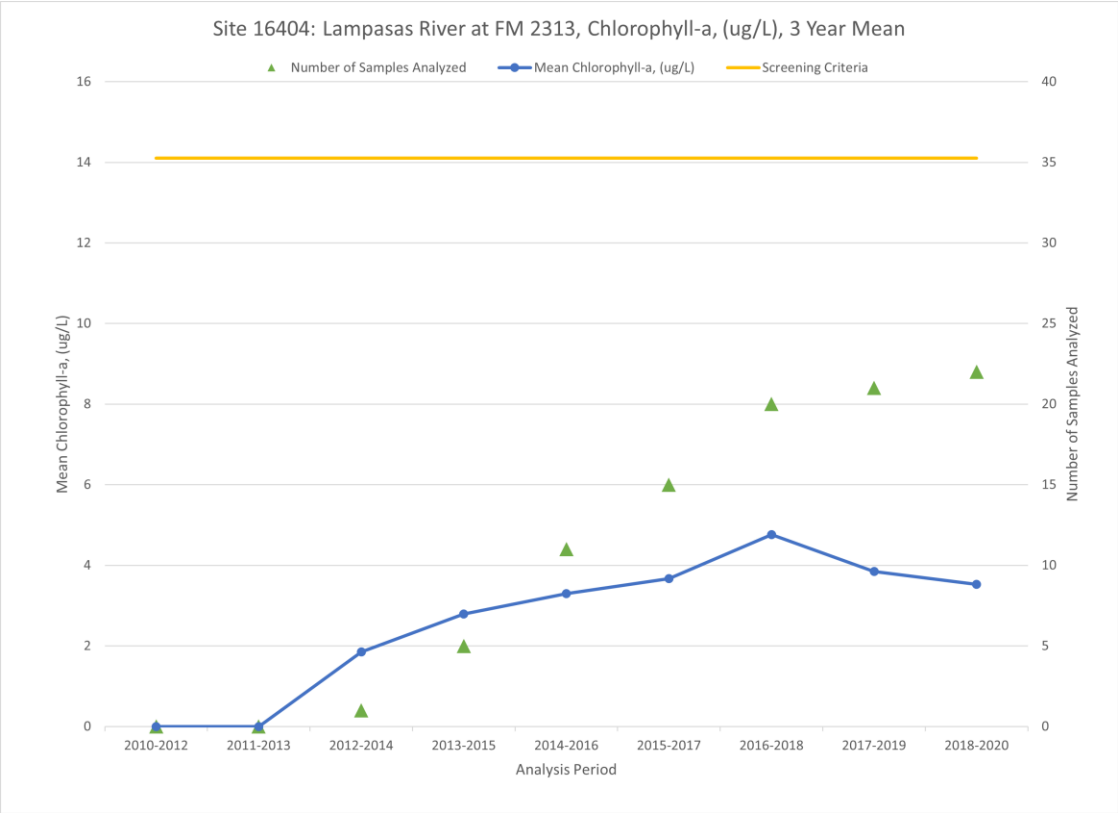

Site 15770: Lampasas River at Lampasas CR 2925, Total Kjeldahl Nitrogen (mg/L), 1 Year Mean
Mean Total Kjeldahl Nitrogen (mg/L)
Screening Criteria
Number of Samples Analyzed
2.500
2.000
1.500
1.000
0.500
0.000
38
33
28
23
18
13
8
3
-2
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Analysis Period

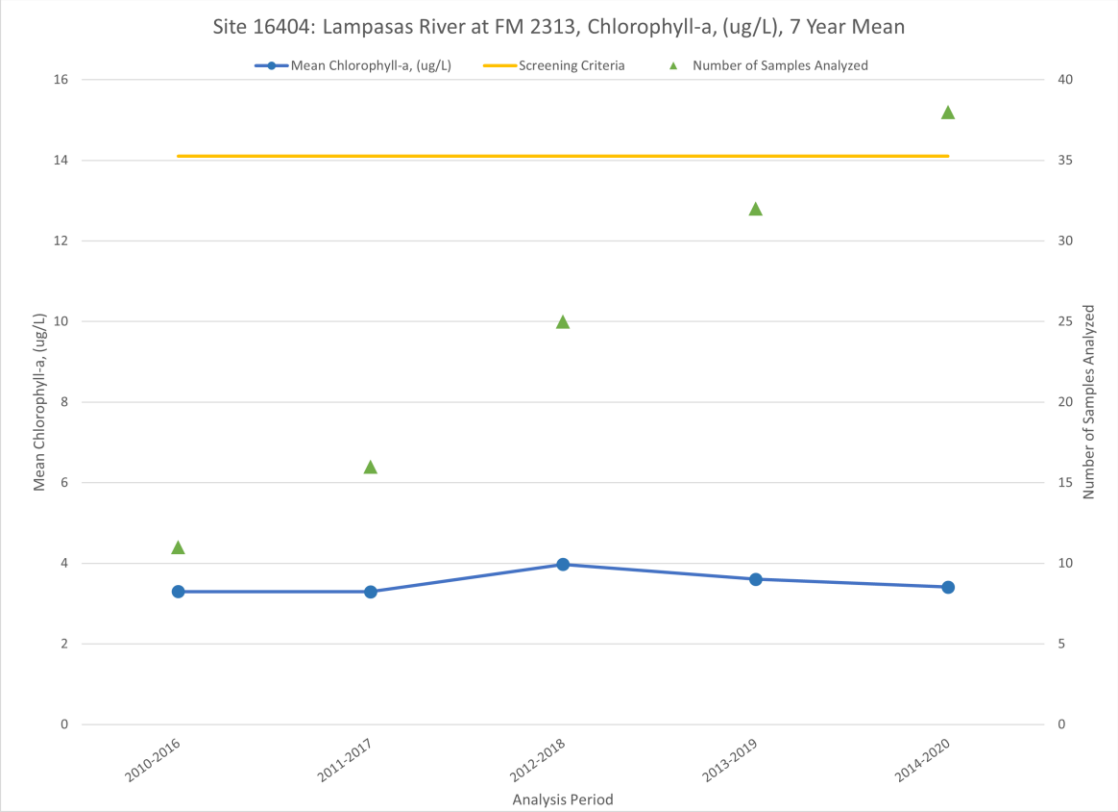

Site 15770: Lampasas River at Lampasas CR 2925, Total Kjeldahl Nitrogen (mg/L), 3 Year Mean
Mean Total Kjeldahl Nitrogen (mg/L)
Screening Criteria
Number of Samples Analyzed
2.500
2.000
1.500
1.000
0.500
0.000
38
33
28
23
18
13
8
3
-2
2011-2013
2012-2014
2013-2015
2014-2016
2015-2017
2016-2018
2017-2019
2018-2019
Analysis Period

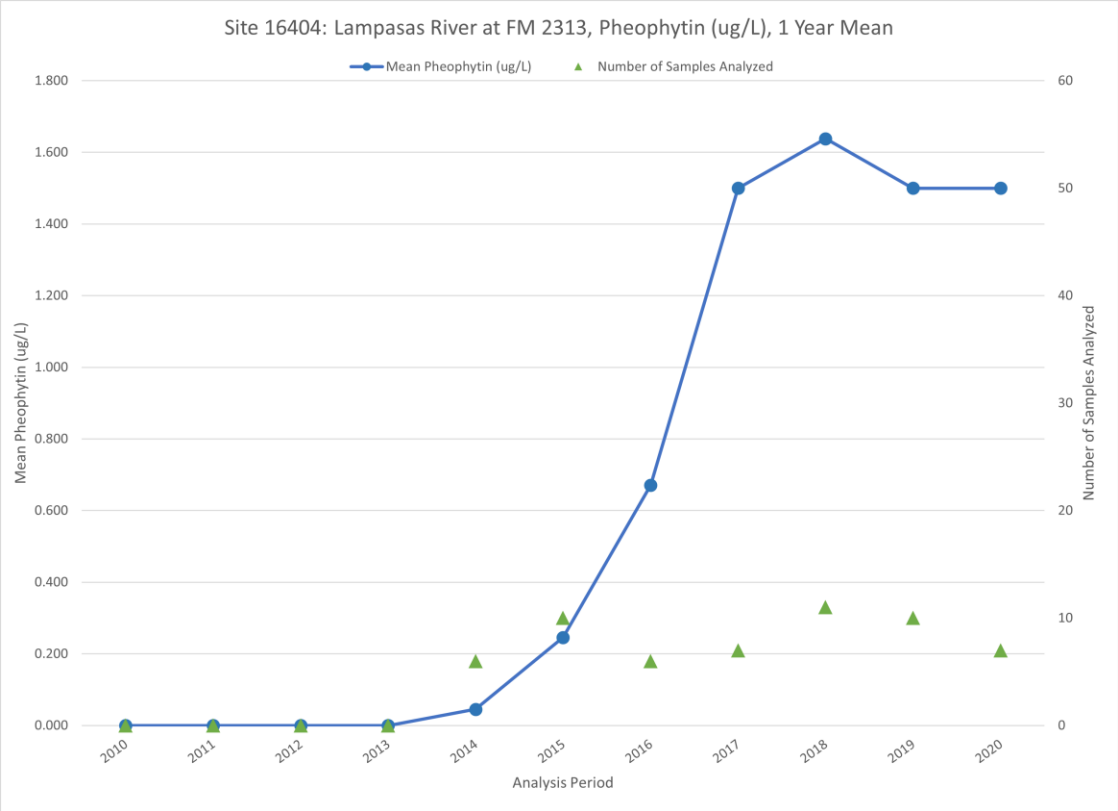

Site 15770: Lampasas River at Lampasas CR 2925, Total Kjeldahl Nitrogen (mg/L), 7 Year Mean
Mean Total Kjeldahl Nitrogen (mg/L)
Screening Criteria
Number of Samples Analyzed
2.500
2.000
1.500
1.000
0.500
0.000
38
37
36
35
34
33
32
31
30
29
28
Mean Total Kjeldahl Nitrogen (mg/L)
Number of Samples Analyzed
2011-2017
2012-2018
2013-2019
2014-2020
Analysis Period

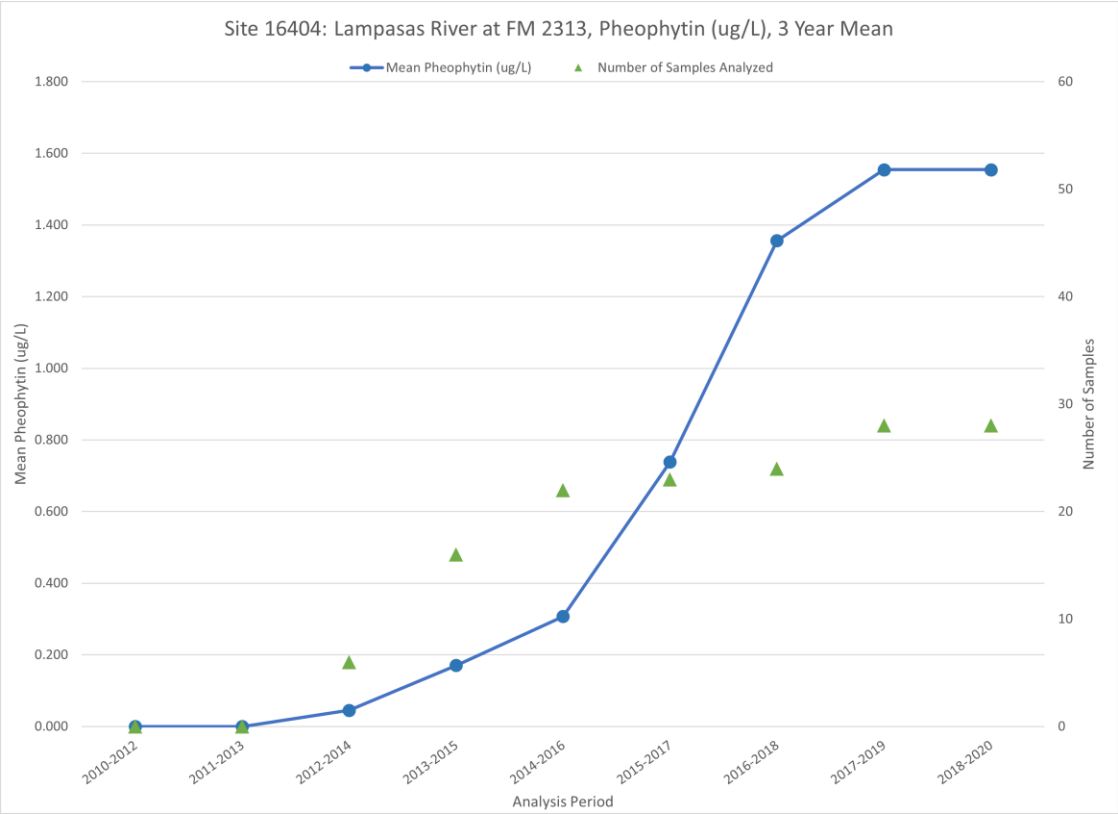
STATION 16404: LAMPASAS RIVER AT FM 2313

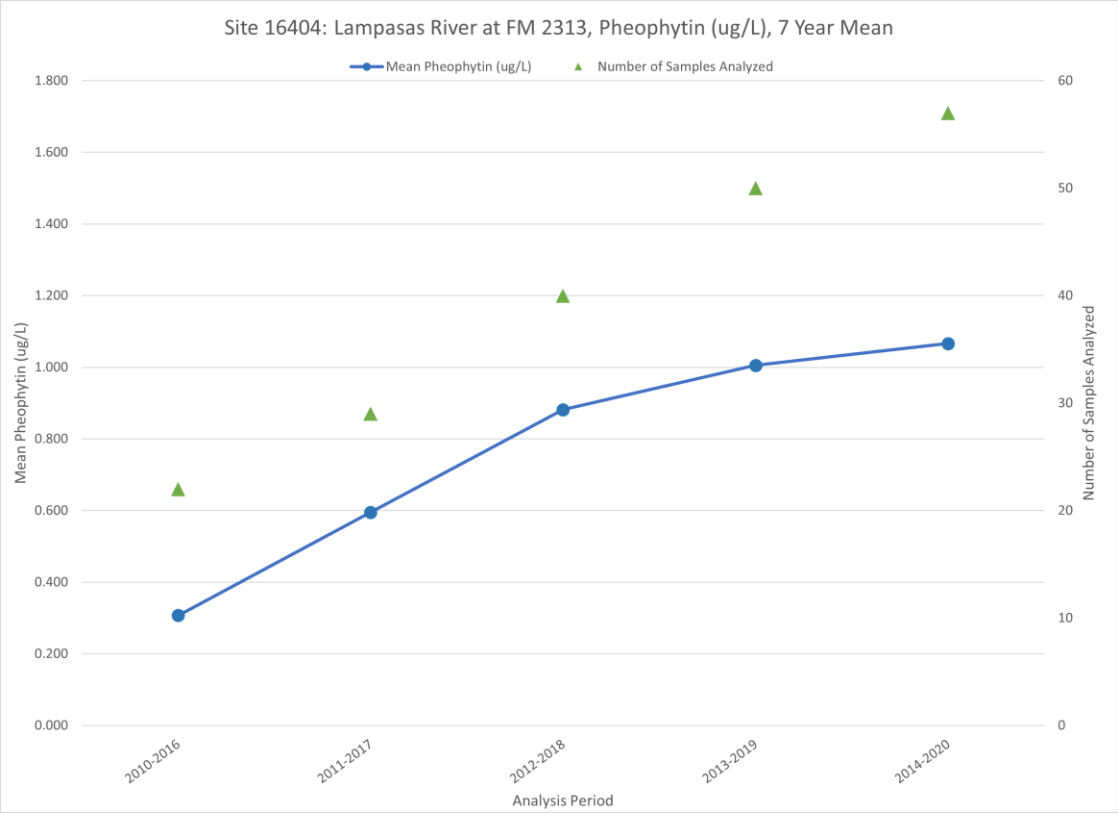


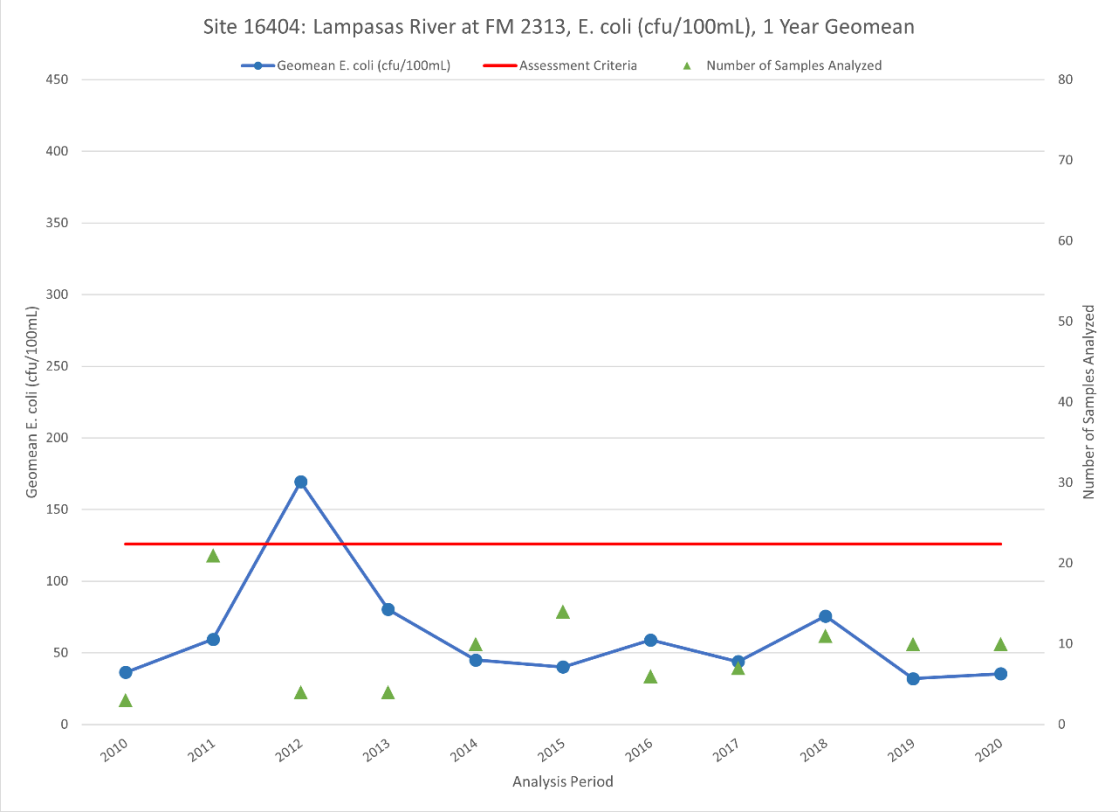


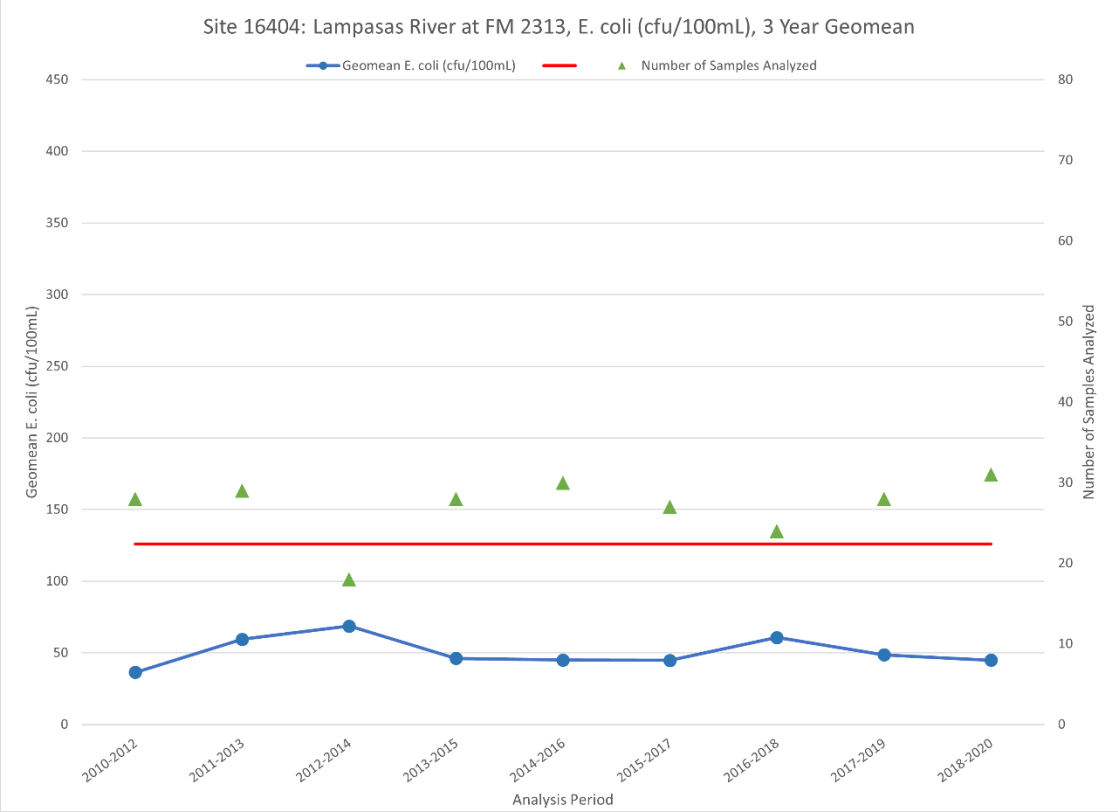

Site 16404: Lampasas River at FM 2313, Chlorophyll-a, (ug/L), 7 Year Mean
Mean Chlorophyll-a, (ug/L)
Screening Criteria
Number of Samples Analyzed
Mean Chlorophyll-a, (ug/L)
Number of Samples Analyzed
0
2
4
6
8
10
12
14
16
0
5
10
15
20
25
30
35
40
2010-2016
2011-2017
2012-2018
2013-2019
2014-2020
Analysis Period

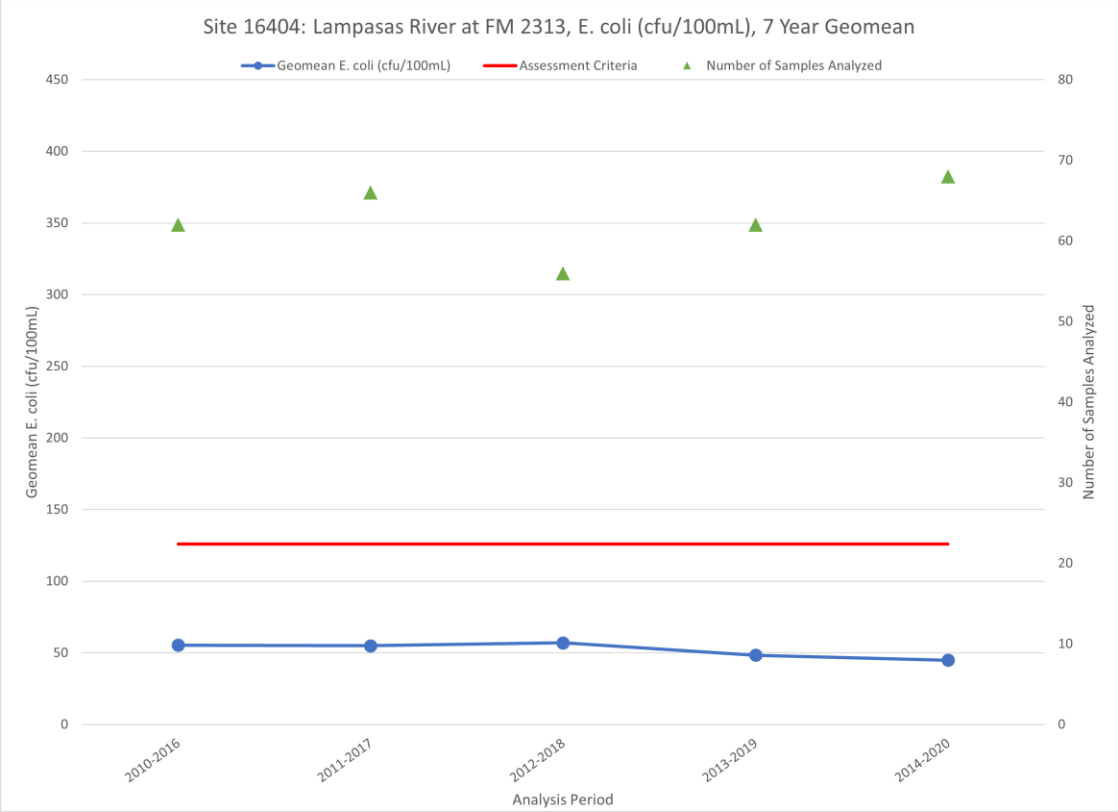

Site 16404: Lampasas River at FM 2313, Pheophytin (ug/L), 1 Year Mean
Mean Pheophytin (ug/L)
Number of Samples Analyzed
Mean Pheophytin (ug/L)
Number of Samples Analyzed
0.000
0.200
0.400
0.600
0.800
1.000
1.200
1.400
1.600
1.800
0
10
20
30
40
50
60
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Analysis Period

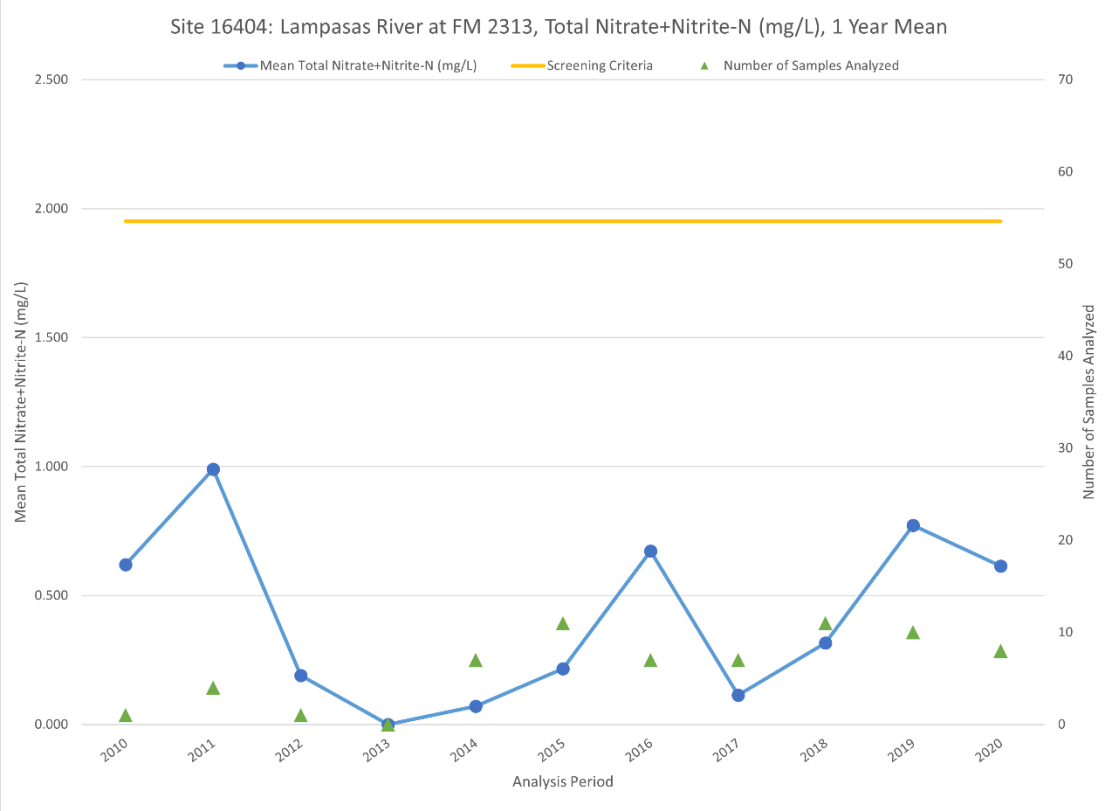

Site 16404: Lampasas River at FM 2313, Pheophytin (ug/L), 3 Year Mean
Mean Pheophytin (ug/L)
Number of Samples Analyzed
Mean Pheophytin (ug/L)
Number of Samples
1.800
1.600
1.400
1.200
1.000
0.800
0.600
0.400
0.200
0.000
60
50
40
30
20
10
0
2010-2012
2011-2013
2012-2014
2013-2015
2014-2016
2015-2017
2016-2018
2017-2019
2018-2020
Analysis Period

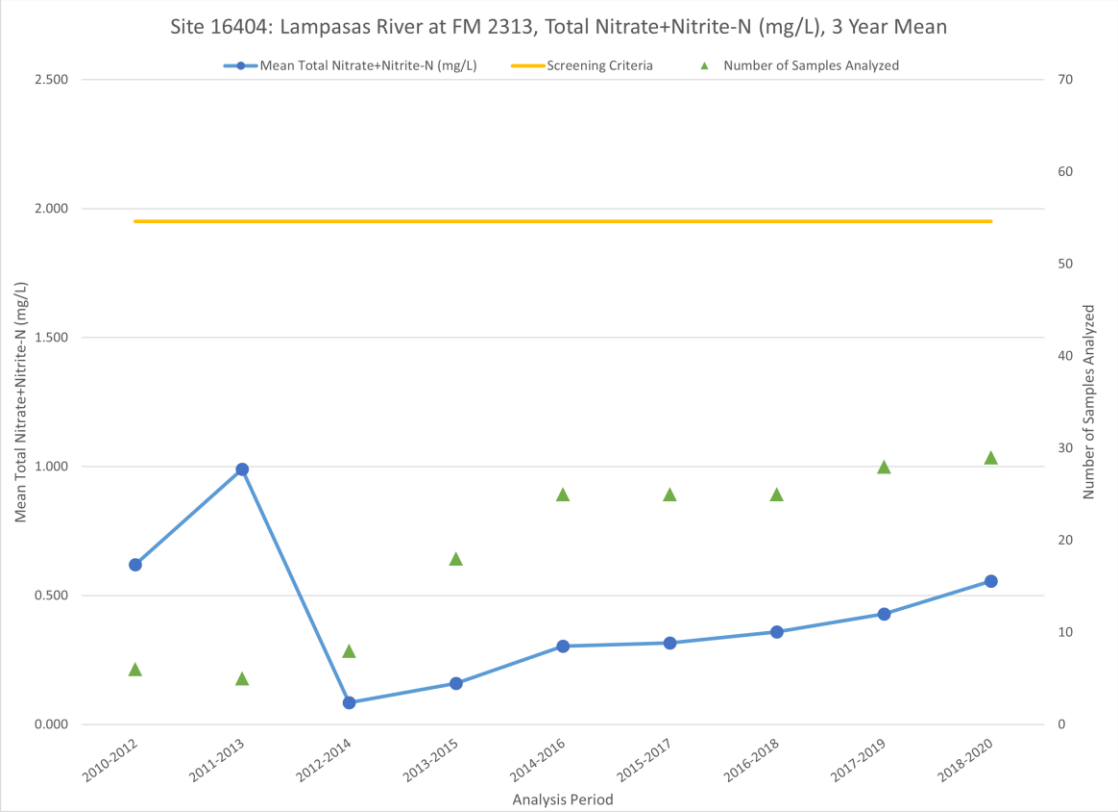

Site 16404: Lampasas River at FM 2313, Pheophytin (ug/L), 7 Year Mean
Mean Pheophytin (ug/L)
Number of Samples Analyzed
Mean Pheophytin (ug/L)
Number of Samples Analyzed
1.800
1.600
1.400
1.200
1.000
0.800
0.600
0.400
0.200
0.000
60
50
40
30
20
10
0
2010-2016
2011-2017
2012-2018
2013-2019
2014-2020
Analysis Period

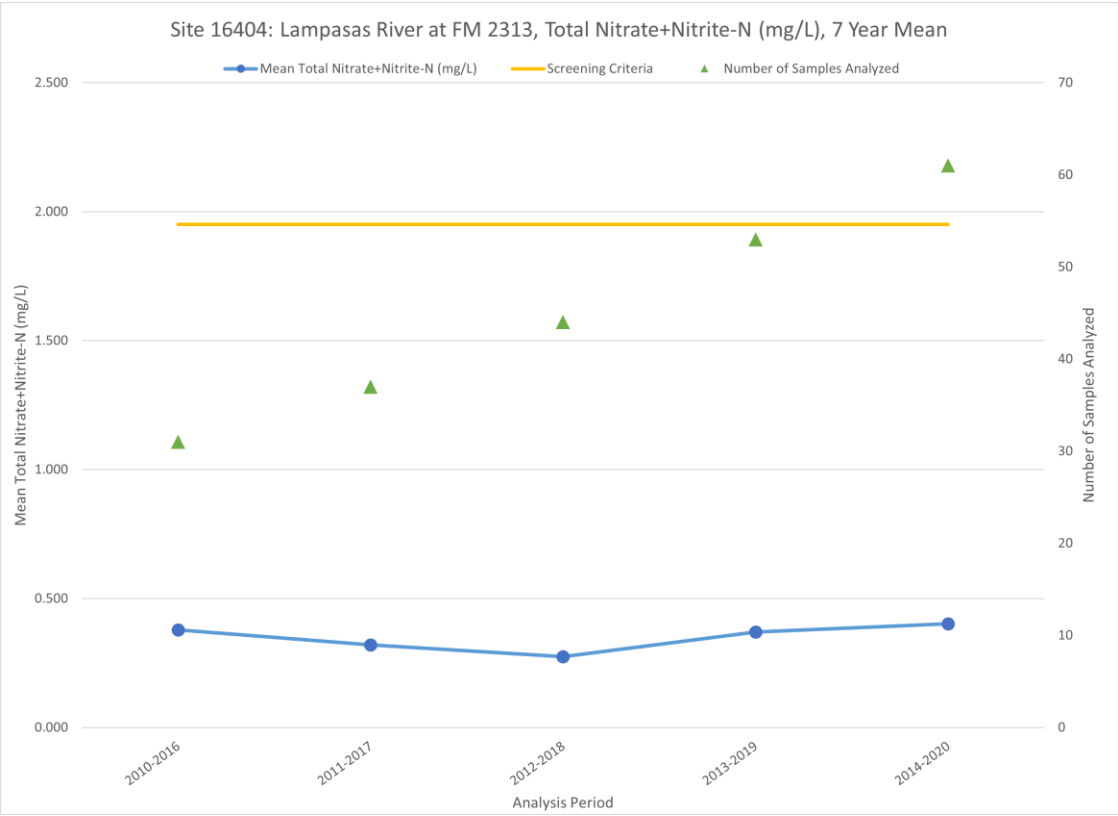

Site 16404: Lampasas River at FM 2313, E. coli (cfu/100mL), 1 Year Geomean
Geomean E. coli (cfu/100mL)
Assessment Criteria
Number of Samples Analyzed
Geomean E. coli (cfu/100mL)
Number of Samples Analyzed
Analysis Period
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

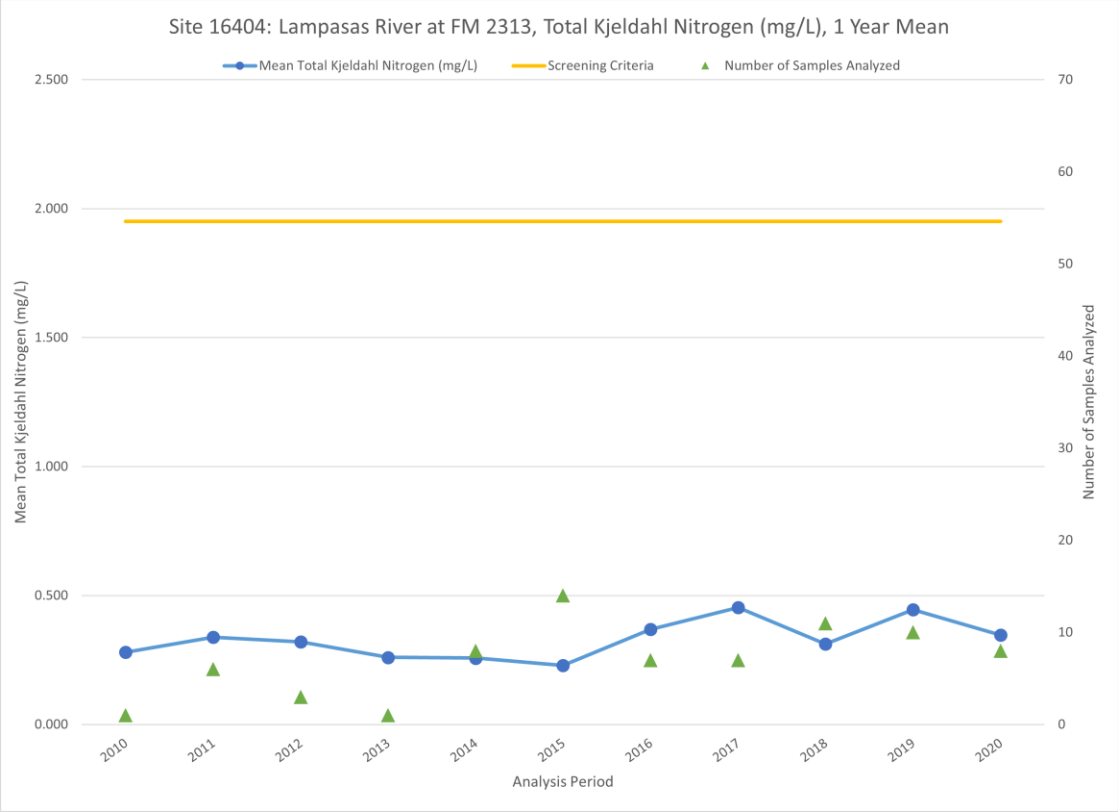

Site 16404: Lampasas River at FM 2313, E. coli (cfu/100mL), 3 Year Geomean
Geomean E. coli (cfu/100mL)
Number of Samples Analyzed
Geomean E. coli (cfu/100mL)
Number of Samples Analyzed
Analysis Period
2010-2012
2011-2013
2012-2014
2013-2015
2014-2016
2015-2017
2016-2018
2017-2019
2018-2020

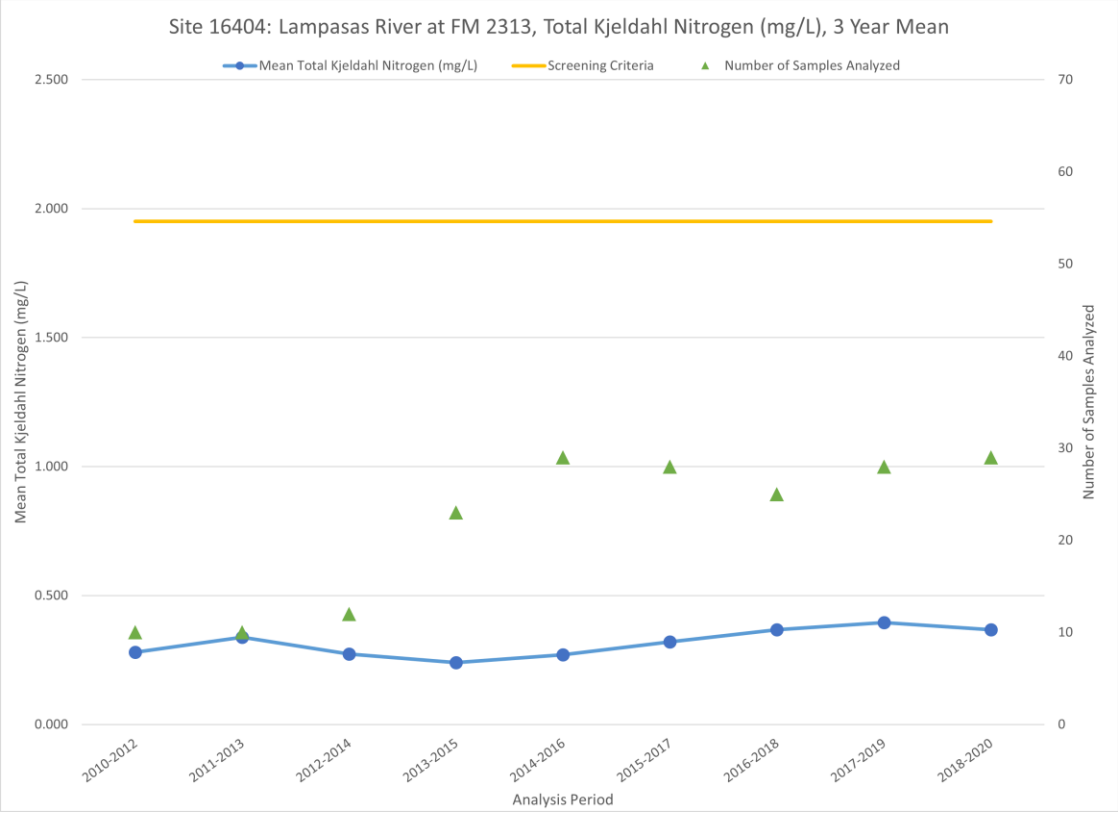

Site 16404: Lampasas River at FM 2313, E. coli (cfu/100mL), 7 Year Geomean
Geomean E. coli (cfu/100mL)
Assessment Criteria
Number of Samples Analyzed
Geomean E. coli (cfu/100mL)
Number of Samples Analyzed
Analysis Period
2010-2016
2011-2017
2012-2018
2013-2019
2014-2020

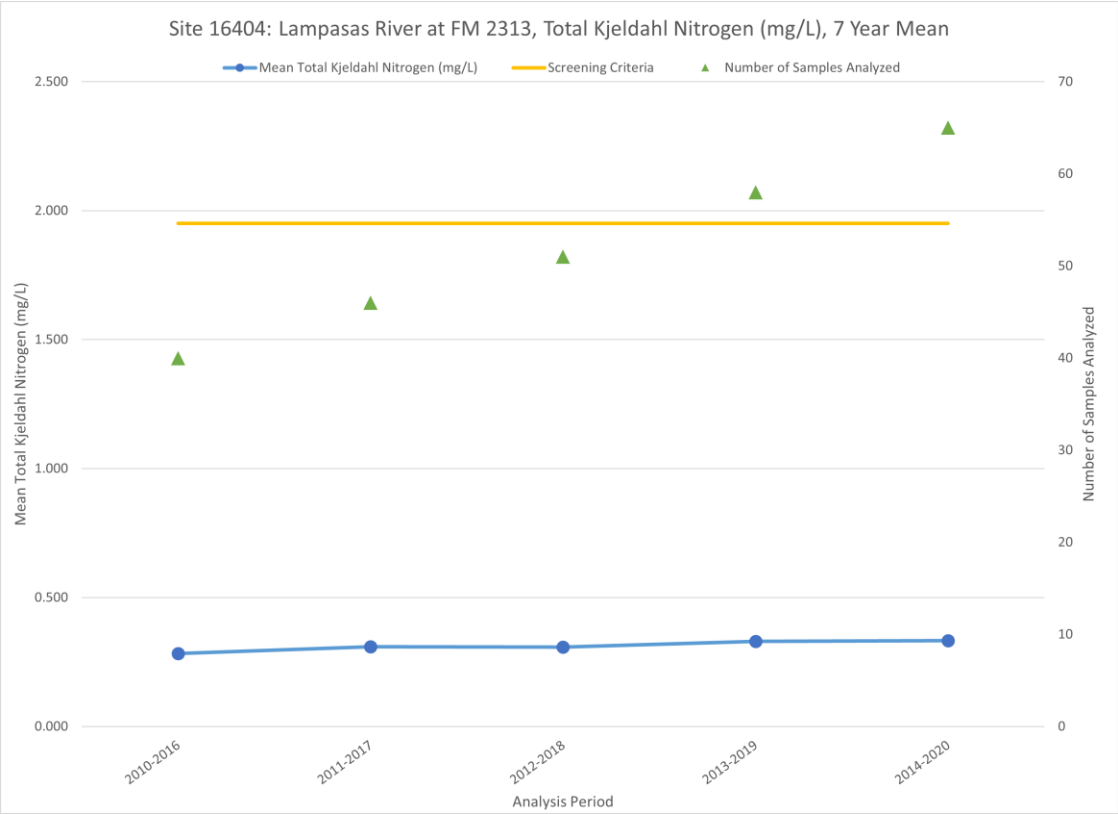

Site 16404: Lampasas River at FM 2313, Total Nitrate+Nitrite-N (mg/L), 1 Year Mean
Mean Total Nitrate+Nitrite-N (mg/L)
Screening Criteria
Number of Samples Analyzed
Mean Total Nitrate+Nitrite-N (mg/L)
Number of Samples Analyzed
Analysis Period


Site 16404: Lampasas River at FM 2313, Total Nitrate+Nitrite-N (mg/L), 3 Year Mean
Mean Total Nitrate+Nitrite-N (mg/L)
Screening Criteria
Number of Samples Analyzed
2.500
2.000
1.500
1.000
0.500
0.000
70
60
50
40
30
20
10
0
2010-2012
2011-2013
2012-2014
2013-2015
2014-2016
2015-2017
2016-2018
2017-2019
2018-2020
Analysis Period

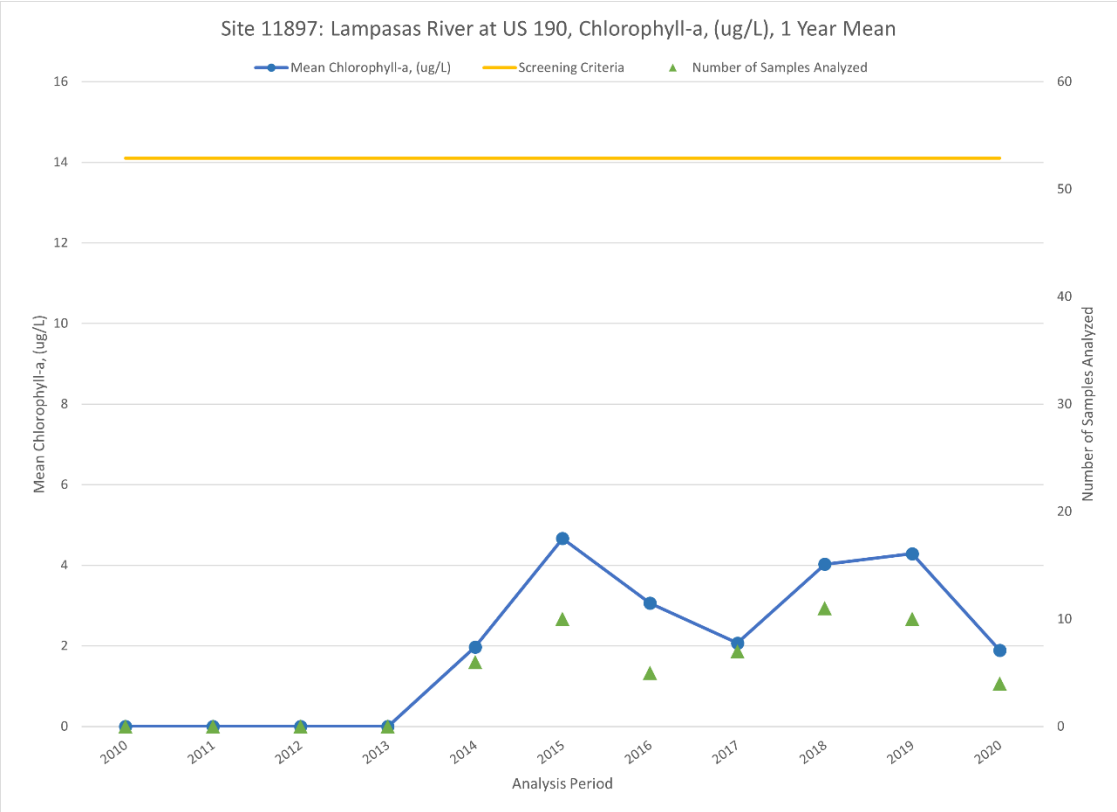

Site 16404: Lampasas River at FM 2313, Total Nitrate+Nitrite-N (mg/L), 7 Year Mean
Mean Total Nitrate+Nitrite-N (mg/L)
Screening Criteria
Number of Samples Analyzed
2.500
2.000
1.500
1.000
0.500
0.000
70
60
50
40
30
20
10
0
2010-2016
2011-2017
2012-2018
2013-2019
2014-2020
Analysis Period

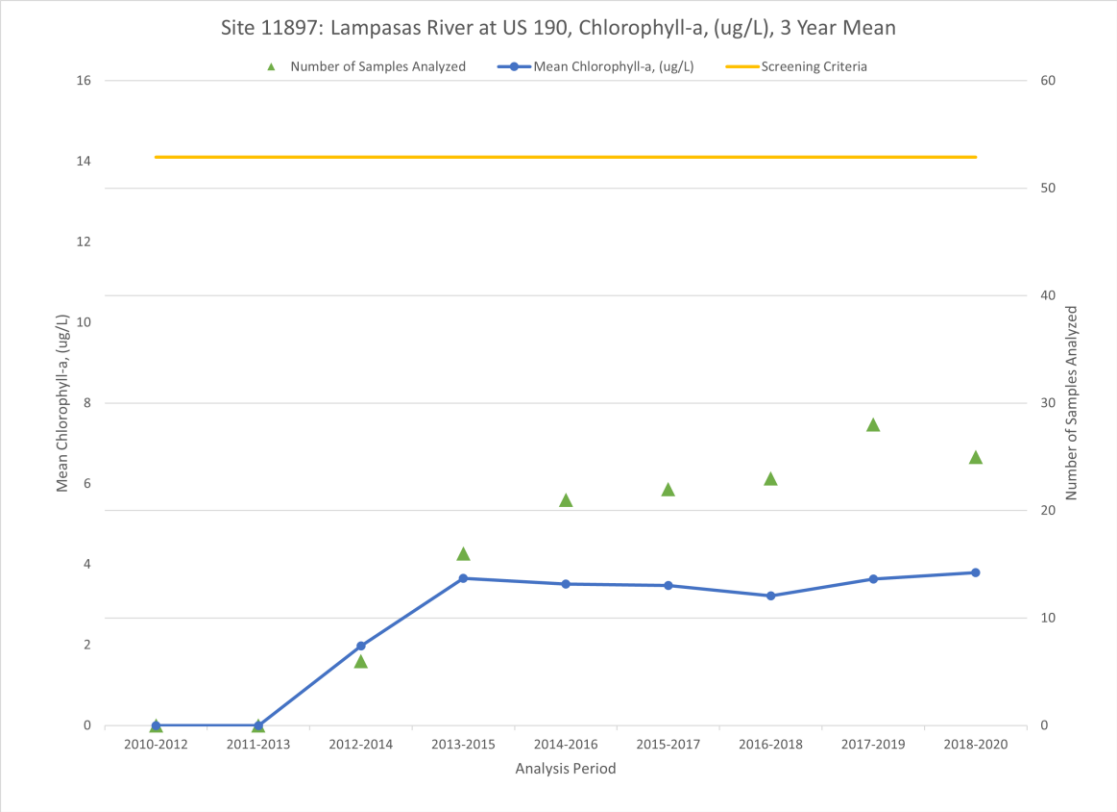

Site 16404: Lampasas River at FM 2313, Total Kjeldahl Nitrogen (mg/L), 1 Year Mean
Mean Total Kjeldahl Nitrogen (mg/L)
Screening Criteria
Number of Samples Analyzed
2.500
2.000
1.500
1.000
0.500
0.000
70
60
50
40
30
20
10
0
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Analysis Period

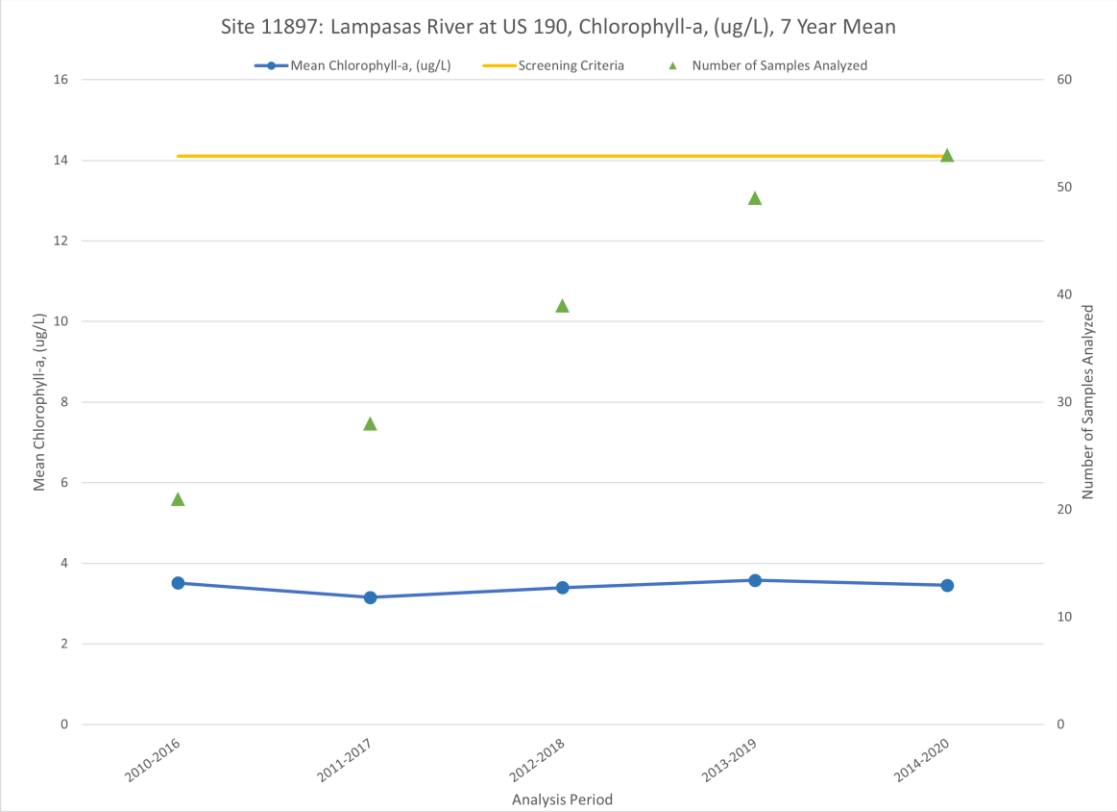

Site 16404: Lampasas River at FM 2313, Total Kjeldahl Nitrogen (mg/L), 3 Year Mean
Mean Total Kjeldahl Nitrogen (mg/L)
Screening Criteria
Number of Samples Analyzed
2.500
2.000
1.500
1.000
0.500
0.000
70
60
50
40
30
20
10
0
2010-2012
2011-2013
2012-2014
2013-2015
2014-2016
2015-2017
2016-2018
2017-2019
2018-2020
Analysis Period

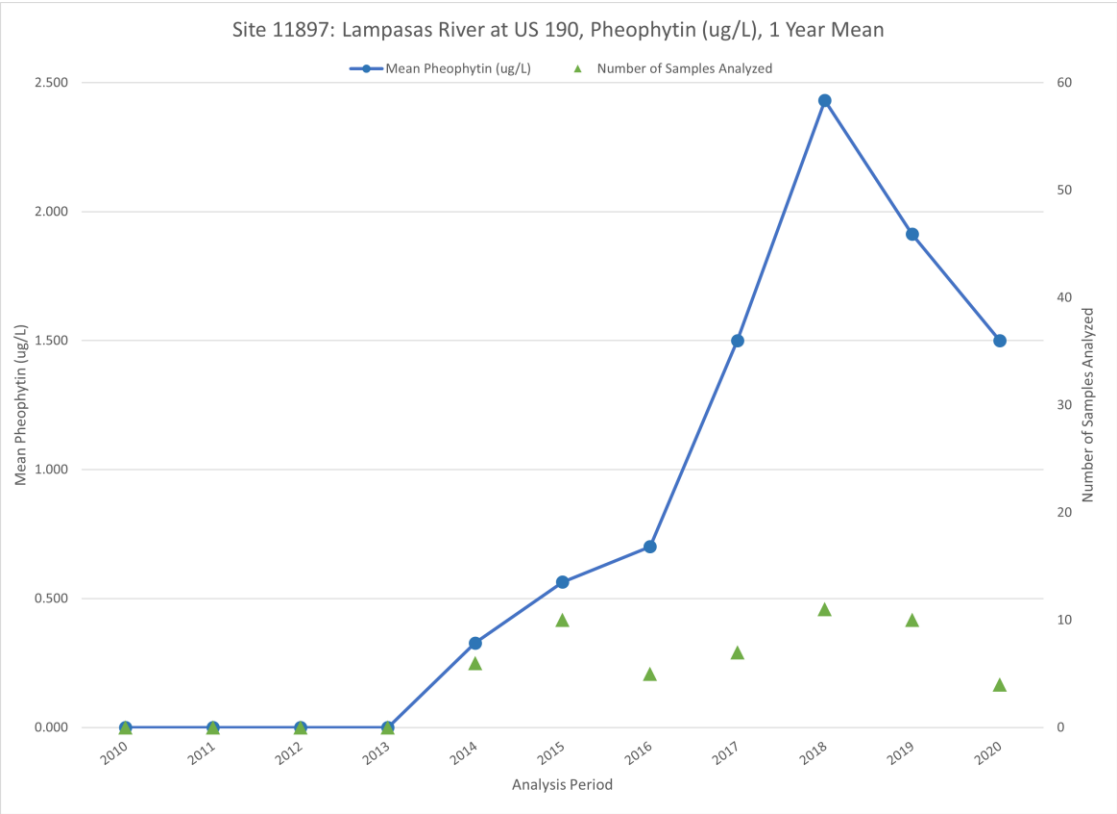

Site 16404: Lampasas River at FM 2313, Total Kjeldahl Nitrogen (mg/L), 7 Year Mean
Mean Total Kjeldahl Nitrogen (mg/L)
Screening Criteria
Number of Samples Analyzed
2.500
2.000
1.500
1.000
0.500
0.000
70
60
50
40
30
20
10
0
Mean Total Kjeldahl Nitrogen (mg/L)
Number of Samples Analyzed
2010-2016
2011-2017
2012-2018
2013-2019
2014-2020
Analysis Period

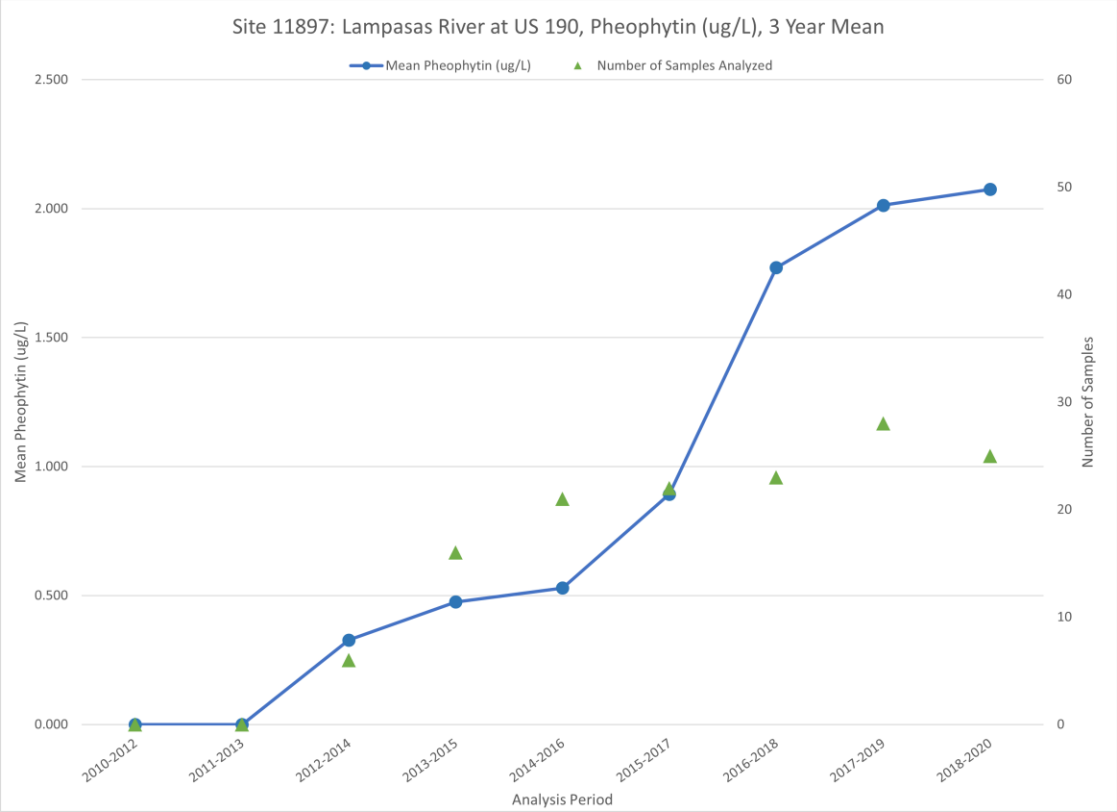
STATION 11897: LAMPASAS RIVER AT US 190

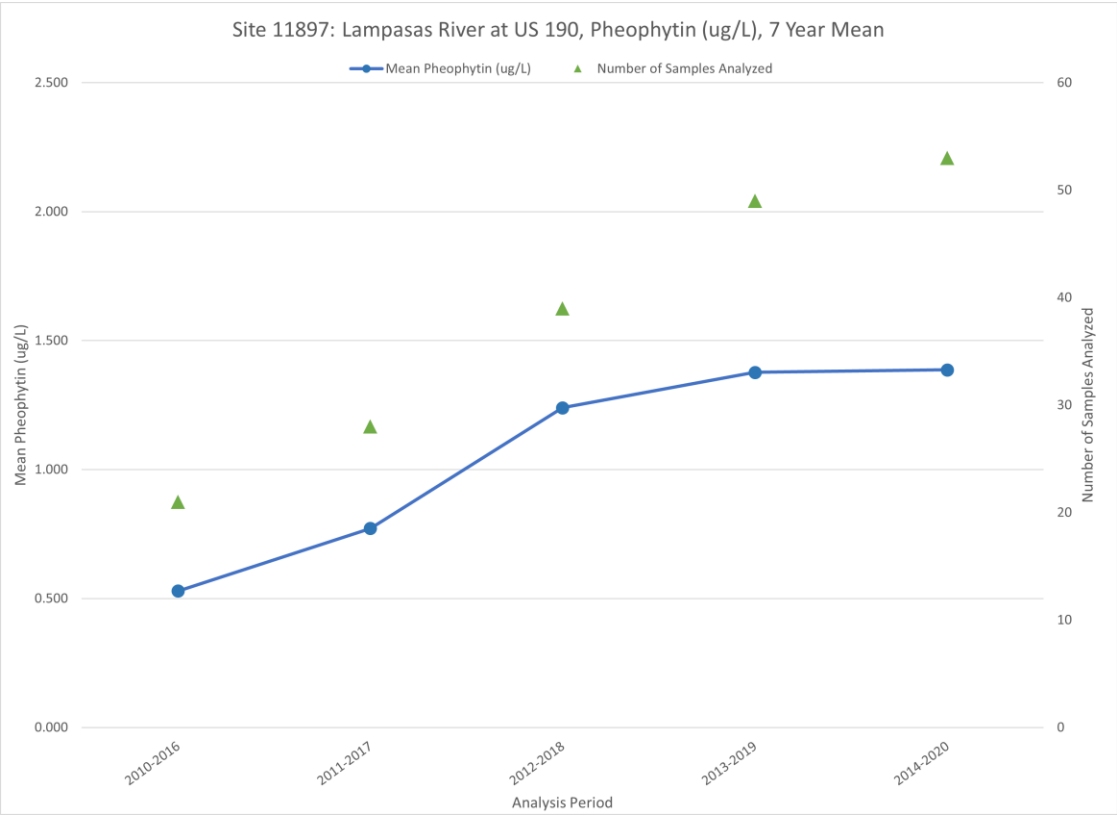


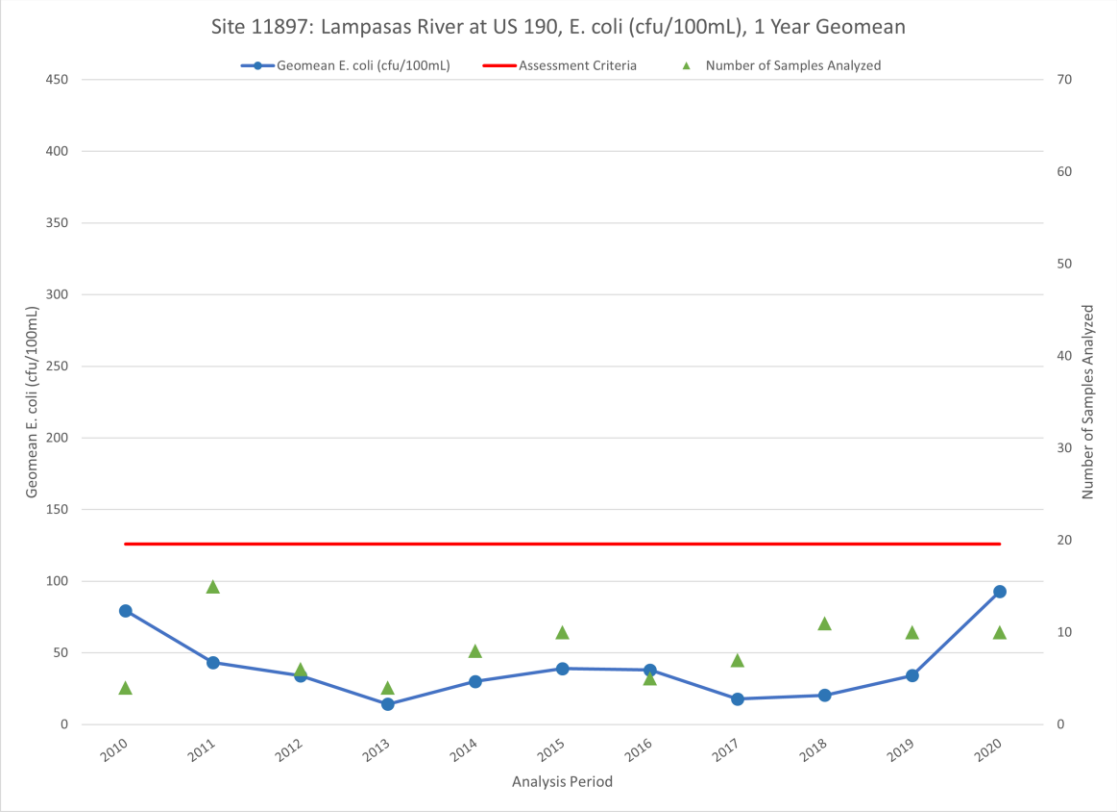


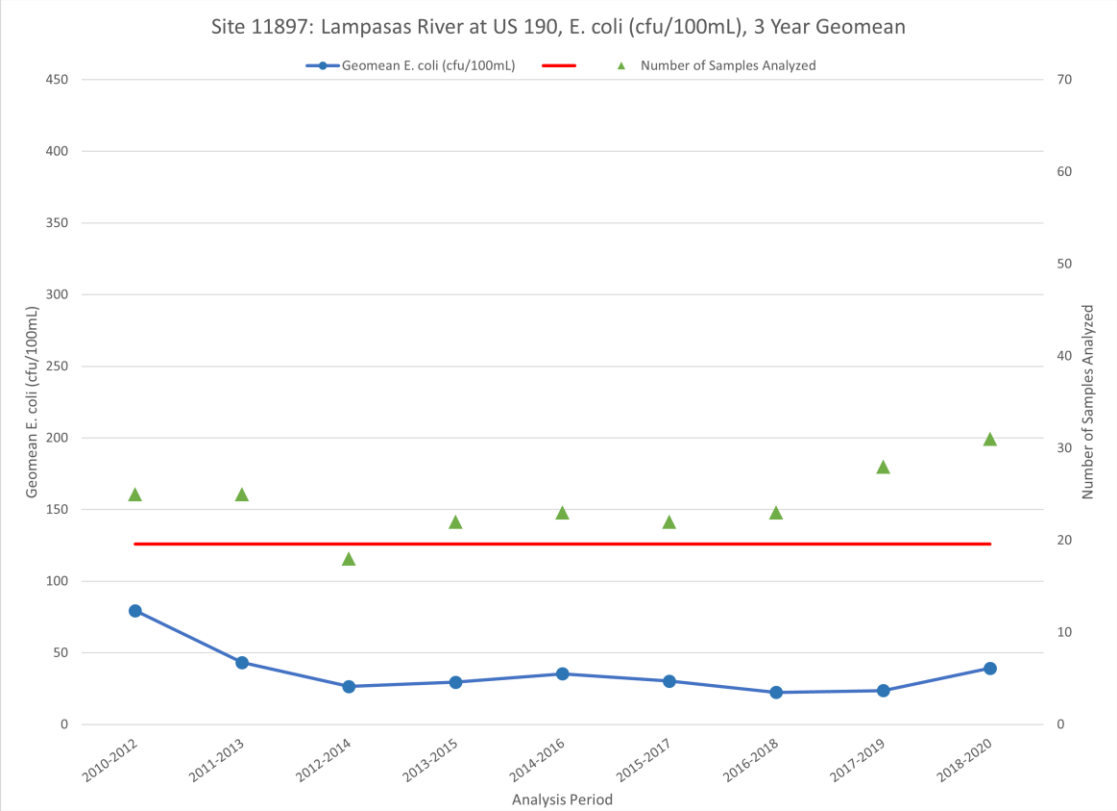

Site 11897: Lampasas River at US 190, Chlorophyll-a, (ug/L), 7 Year Mean
Mean Chlorophyll-a, (ug/L)
Screening Criteria
Number of Samples Analyzed
Mean Chlorophyll-a, (ug/L)
Number of Samples Analyzed
0
2
4
6
8
10
12
14
16
0
10
20
30
40
50
60
2010-2016
2011-2017
2012-2018
2013-2019
2014-2020
Analysis Period

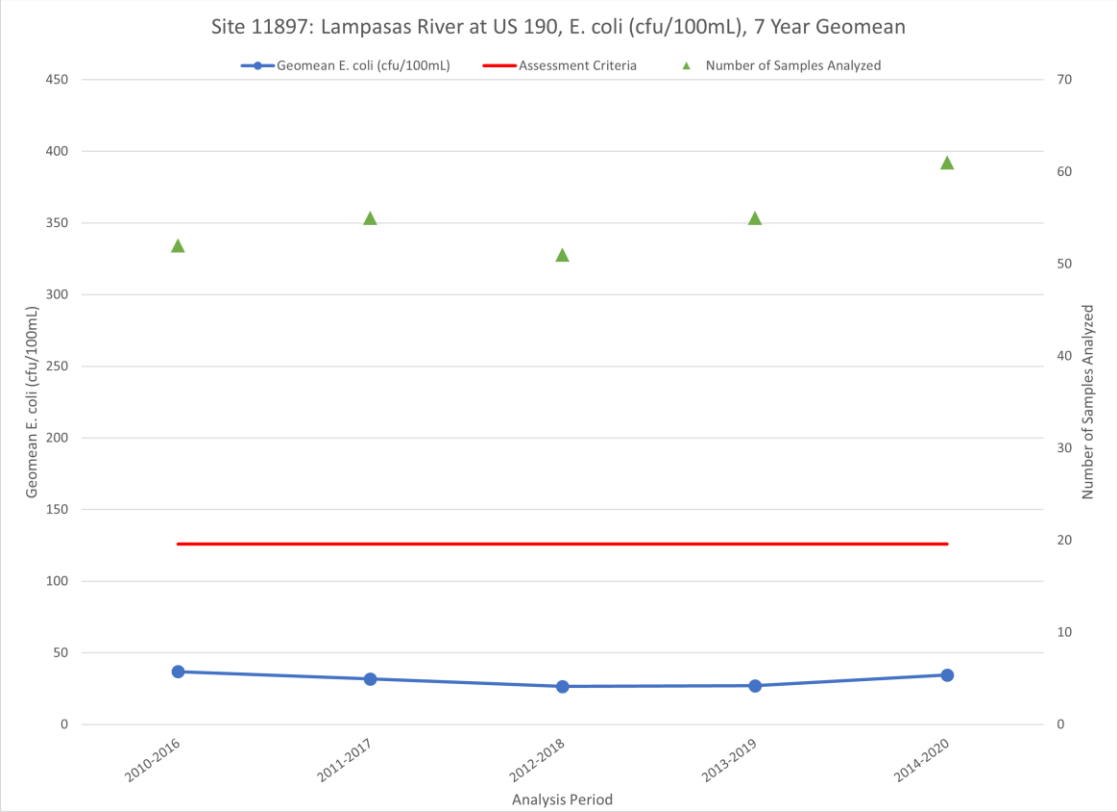

Site 11897: Lampasas River at US 190, Pheophytin (ug/L), 1 Year Mean
Mean Pheophytin (ug/L)
Number of Samples Analyzed
Mean Pheophytin (ug/L)
Number of Samples Analyzed
0.000
0.500
1.000
1.500
2.000
2.500
0
10
20
30
40
50
60
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Analysis Period

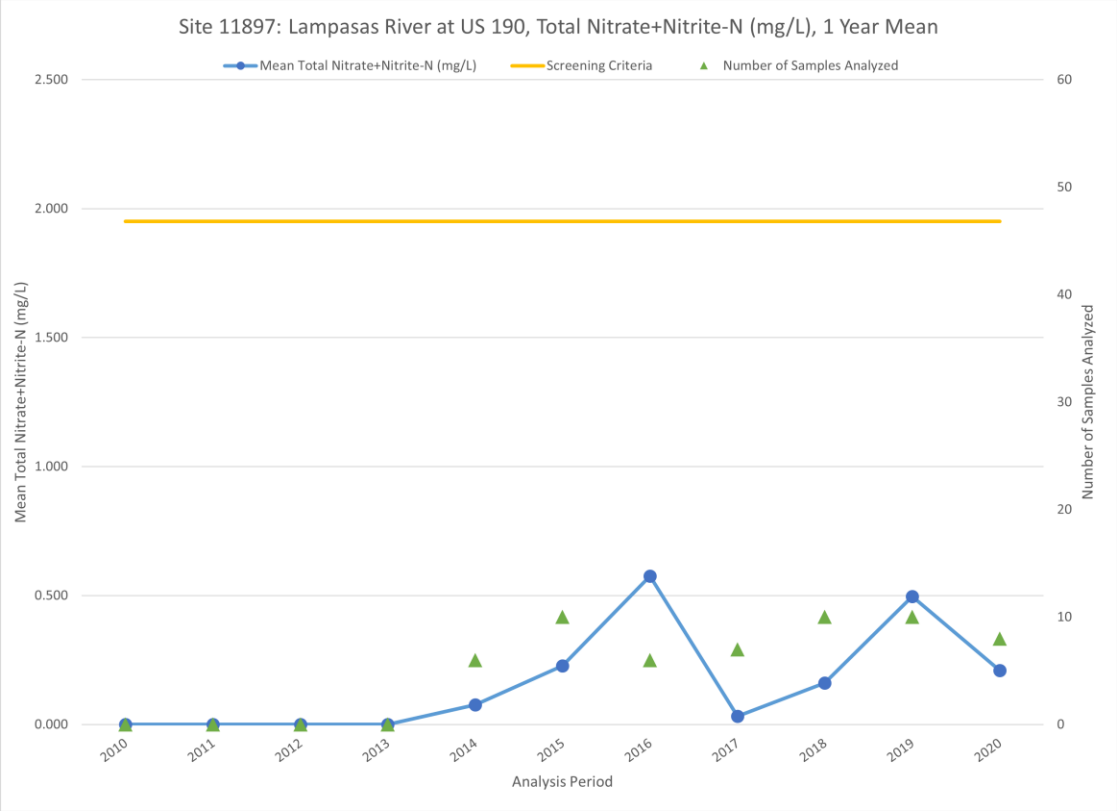

Site 11897: Lampasas River at US 190, Pheophytin (ug/L), 3 Year Mean
Mean Pheophytin (ug/L)
Number of Samples Analyzed
Mean Pheophytin (ug/L)
Number of Samples
Analysis Period
2.500
2.000
1.500
1.000
0.500
0.000
60
50
40
30
20
10
0
2010-2012
2011-2013
2012-2014
2013-2015
2014-2016
2015-2017
2016-2018
2017-2019
2018-2020

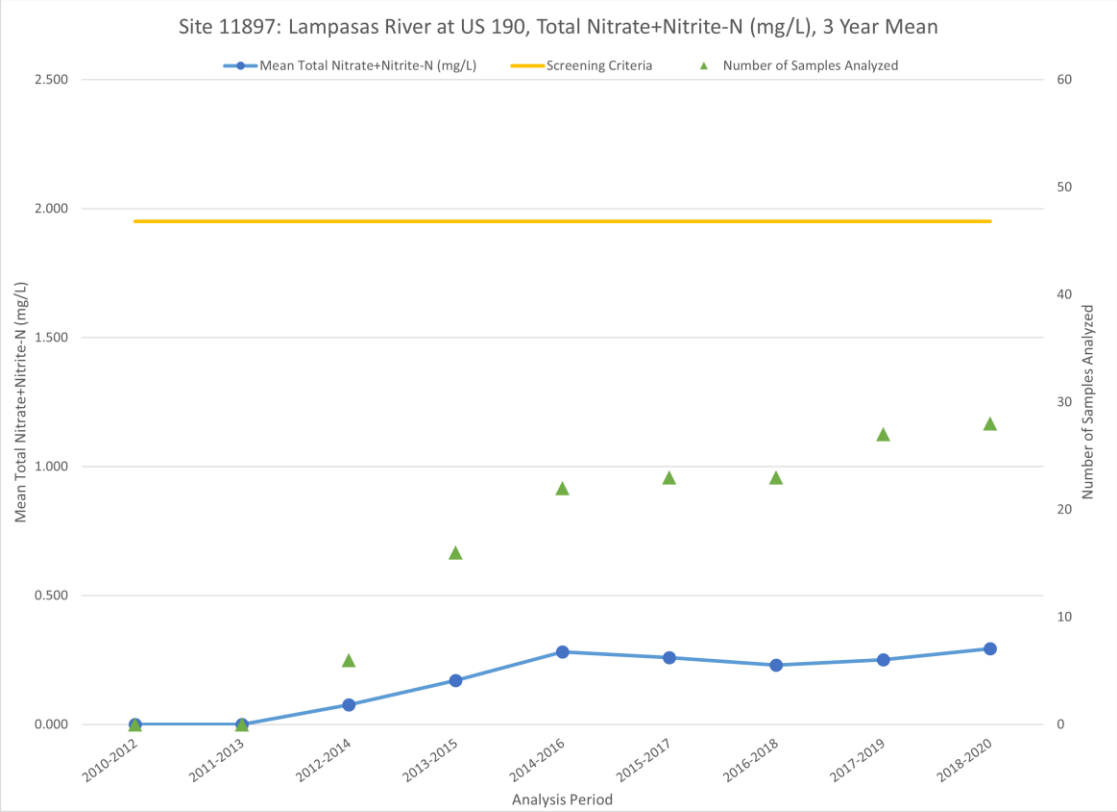

Site 11897: Lampasas River at US 190, Pheophytin (ug/L), 7 Year Mean
Mean Pheophytin (ug/L)
Number of Samples Analyzed
Mean Pheophytin (ug/L)
Number of Samples Analyzed
Analysis Period
2.500
2.000
1.500
1.000
0.500
0.000
60
50
40
30
20
10
0
2010-2016
2011-2017
2012-2018
2013-2019
2014-2020

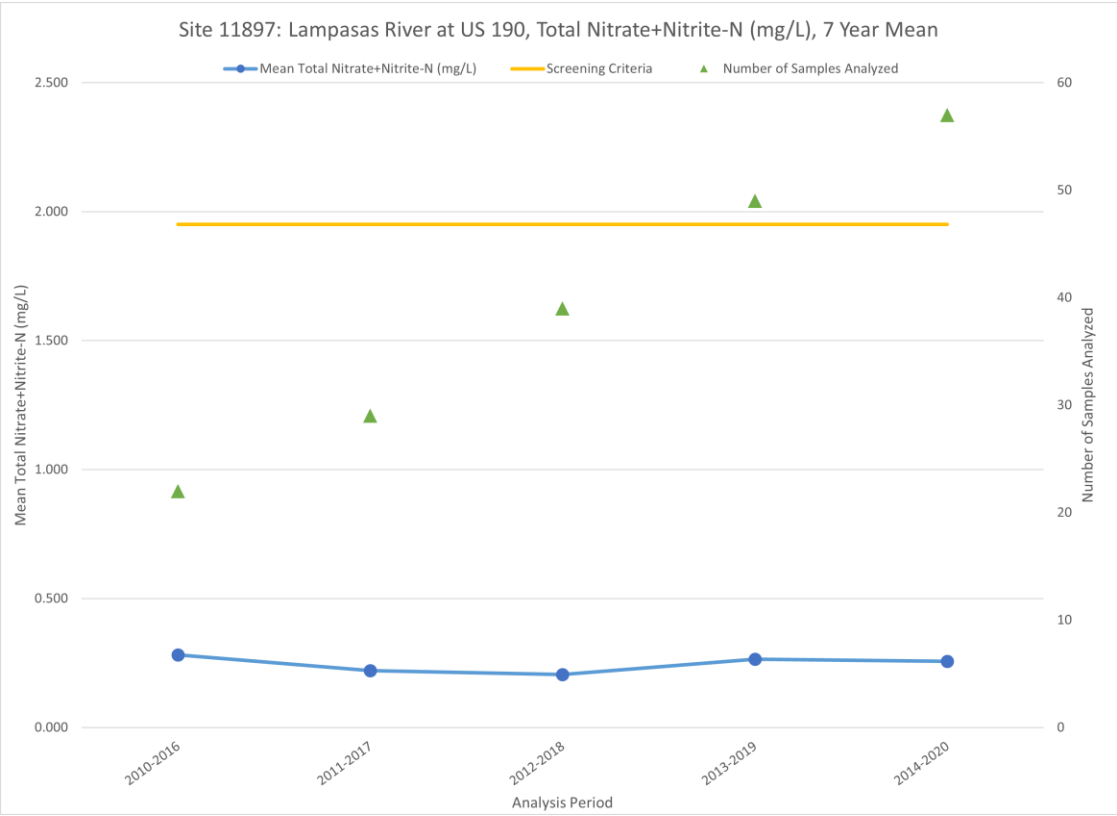

Site 11897: Lampasas River at US 190, E. coli (cfu/100mL), 1 Year Geomean
Geomean E. coli (cfu/100mL)
Assessment Criteria
Number of Samples Analyzed
Geomean E. coli (cfu/100mL)
Number of Samples Analyzed
Analysis Period
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

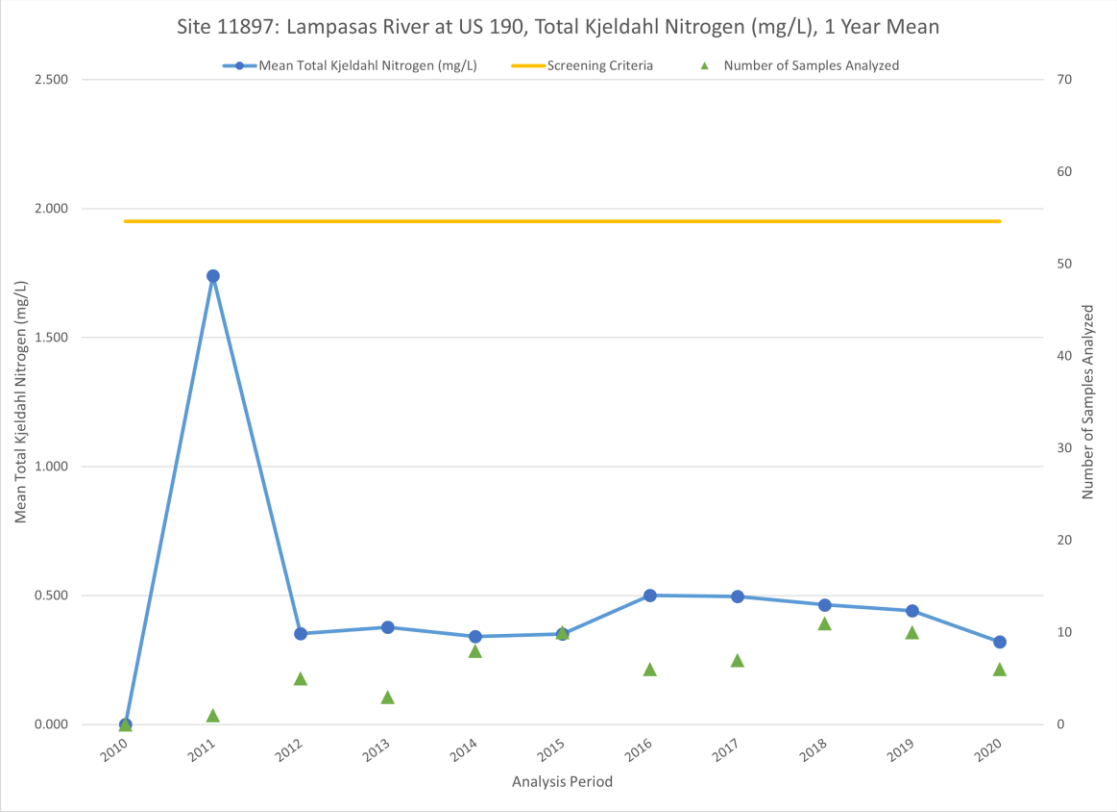

Site 11897: Lampasas River at US 190, E. coli (cfu/100mL), 3 Year Geomean
Geomean E. coli (cfu/100mL)
Number of Samples Analyzed
Geomean E. coli (cfu/100mL)
Number of Samples Analyzed
Analysis Period
2010-2012
2011-2013
2012-2014
2013-2015
2014-2016
2015-2017
2016-2018
2017-2019
2018-2020

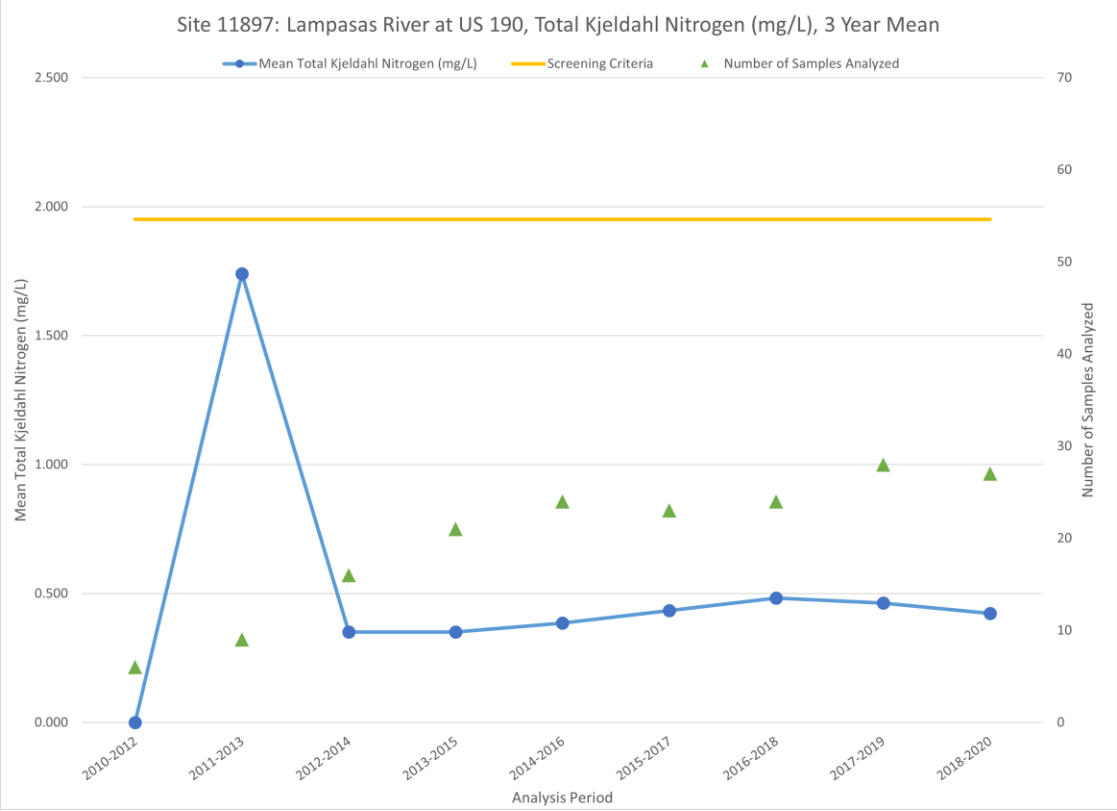

Site 11897: Lampasas River at US 190, E. coli (cfu/100mL), 7 Year Geomean
Geomean E. coli (cfu/100mL)
Assessment Criteria
Number of Samples Analyzed
Geomean E. coli (cfu/100mL)
Number of Samples Analyzed
Analysis Period
2010-2016
2011-2017
2012-2018
2013-2019
2014-2020

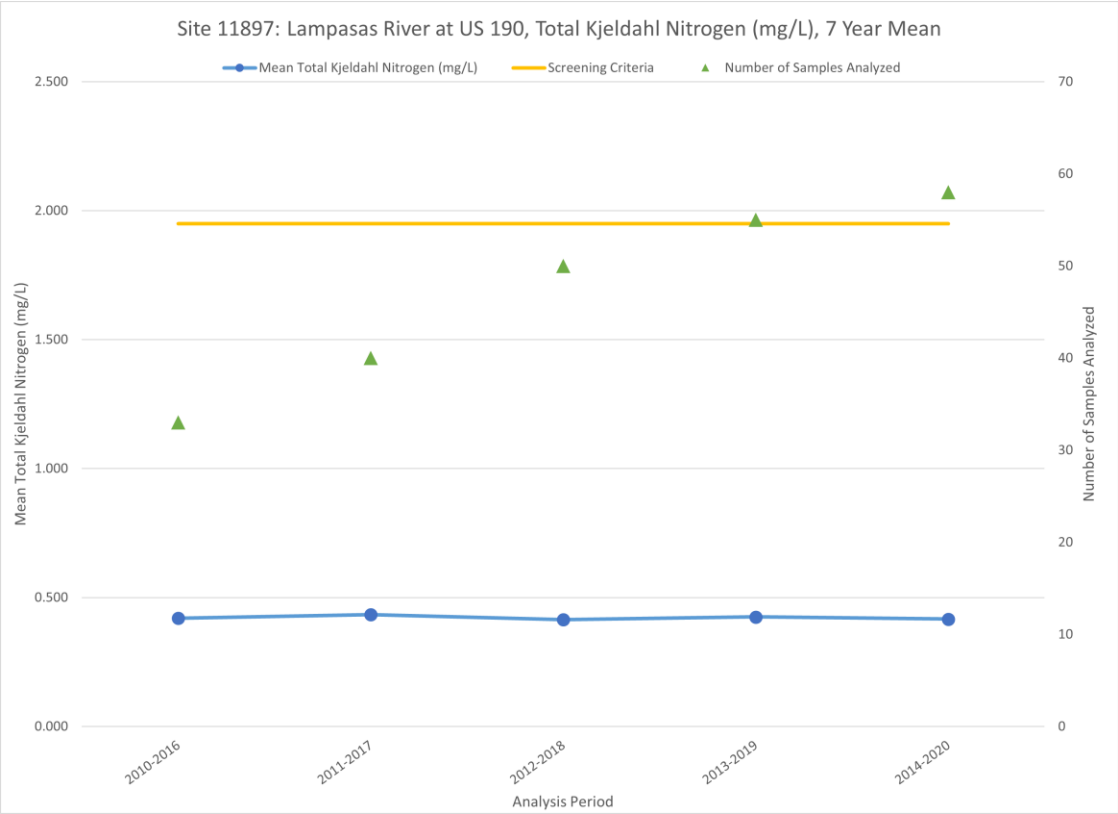

Site 11897: Lampasas River at US 190, Total Nitrate+Nitrite-N (mg/L), 1 Year Mean
Mean Total Nitrate+Nitrite-N (mg/L)
Screening Criteria
Number of Samples Analyzed
Mean Total Nitrate+Nitrite-N (mg/L)
Number of Samples Analyzed
Analysis Period


Site 11897: Lampasas River at US 190, Total Nitrate+Nitrite-N (mg/L), 3 Year Mean
Mean Total Nitrate+Nitrite-N (mg/L)
Screening Criteria
Number of Samples Analyzed
2.500
2.000
1.500
1.000
0.500
0.000
60
50
40
30
20
10
0
Mean Total Nitrate+Nitrite-N (mg/L)
Number of Samples Analyzed
2010-2012
2011-2013
2012-2014
2013-2015
2014-2016
2015-2017
2016-2018
2017-2019
2018-2020
Analysis Period

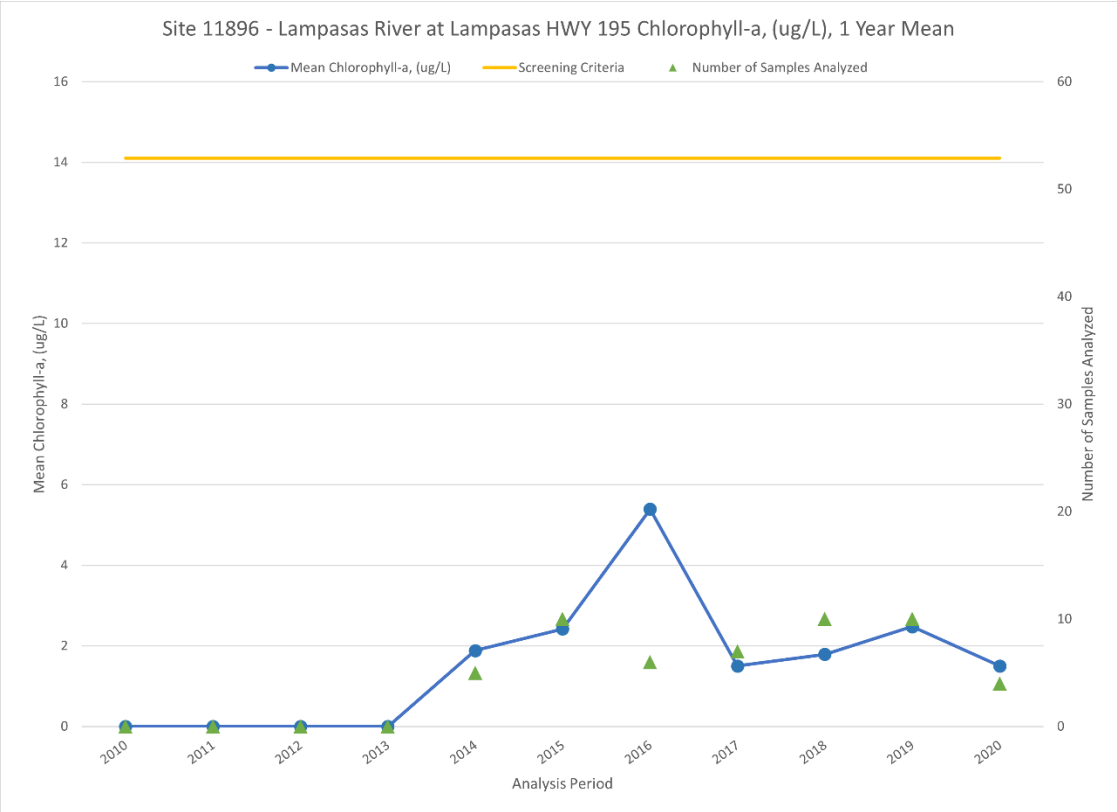

Site 11897: Lampasas River at US 190, Total Nitrate+Nitrite-N (mg/L), 7 Year Mean
Mean Total Nitrate+Nitrite-N (mg/L)
Screening Criteria
Number of Samples Analyzed
2.500
2.000
1.500
1.000
0.500
0.000
60
50
40
30
20
10
0
Mean Total Nitrate+Nitrite-N (mg/L)
Number of Samples Analyzed
2010-2016
2011-2017
2012-2018
2013-2019
2014-2020
Analysis Period

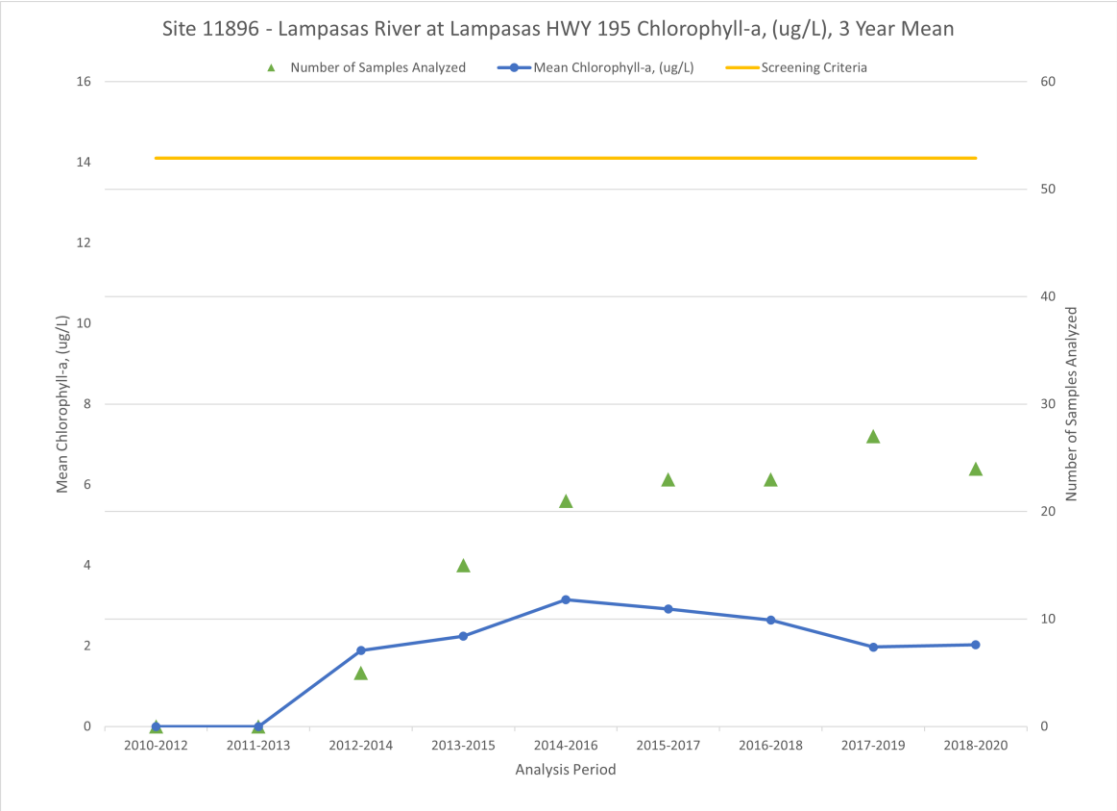

Site 11897: Lampasas River at US 190, Total Kjeldahl Nitrogen (mg/L), 1 Year Mean
Mean Total Kjeldahl Nitrogen (mg/L)
Screening Criteria
Number of Samples Analyzed
Mean Total Kjeldahl Nitrogen (mg/L)
Number of Samples Analyzed
Analysis Period
2.500
2.000
1.500
1.000
0.500
0.000
70
60
50
40
30
20
10
0
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

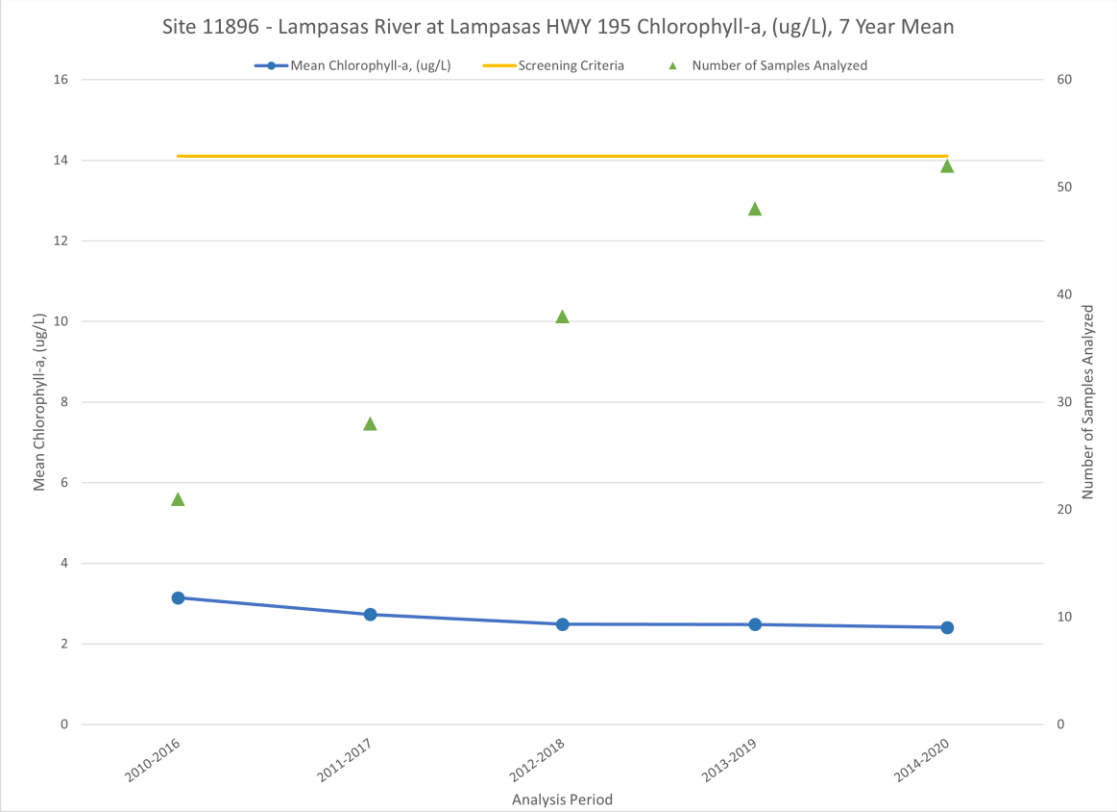

Site 11897: Lampasas River at US 190, Total Kjeldahl Nitrogen (mg/L), 3 Year Mean
Mean Total Kjeldahl Nitrogen (mg/L)
Screening Criteria
Number of Samples Analyzed
Mean Total Kjeldahl Nitrogen (mg/L)
Number of Samples Analyzed
Analysis Period
2.500
2.000
1.500
1.000
0.500
0.000
70
60
50
40
30
20
10
0
2010-2012
2011-2013
2012-2014
2013-2015
2014-2016
2015-2017
2016-2018
2017-2019
2018-2020

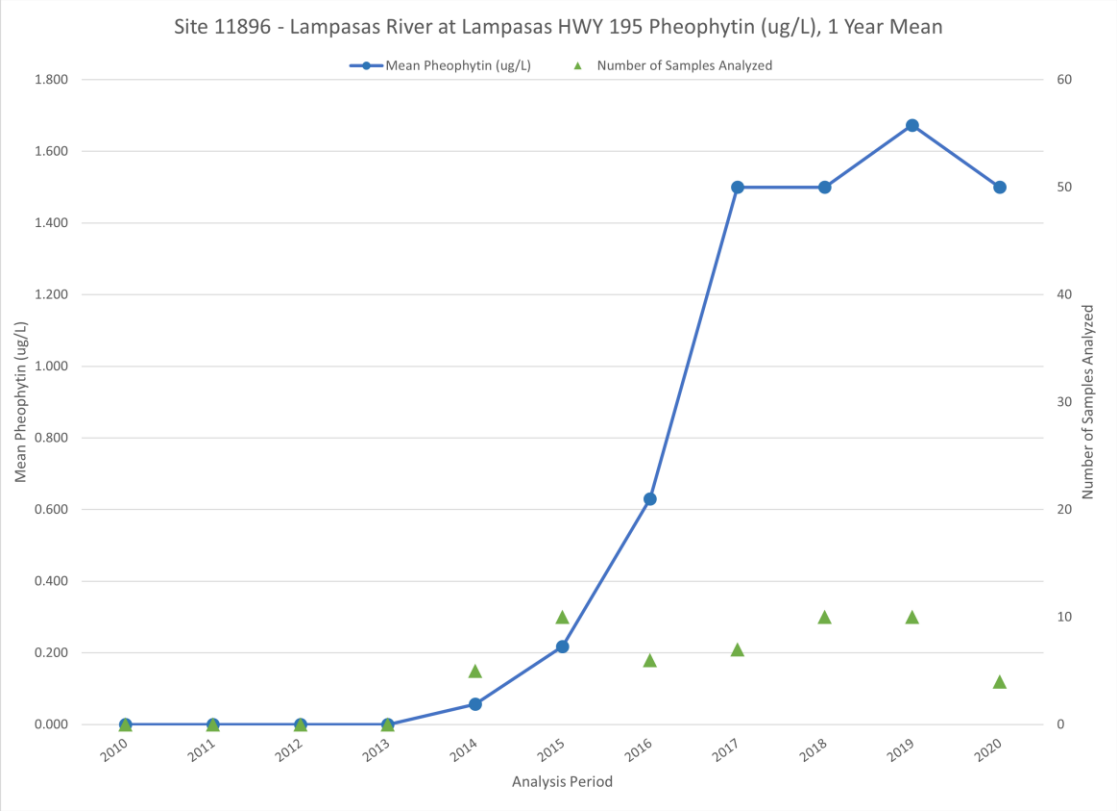

Site 11897: Lampasas River at US 190, Total Kjeldahl Nitrogen (mg/L), 7 Year Mean
Mean Total Kjeldahl Nitrogen (mg/L)
Screening Criteria
Number of Samples Analyzed
2.500
2.000
1.500
1.000
0.500
0.000
70
60
50
40
30
20
10
0
Mean Total Kjeldahl Nitrogen (mg/L)
Number of Samples Analyzed
2010-2016
2011-2017
2012-2018
2013-2019
2014-2020
Analysis Period

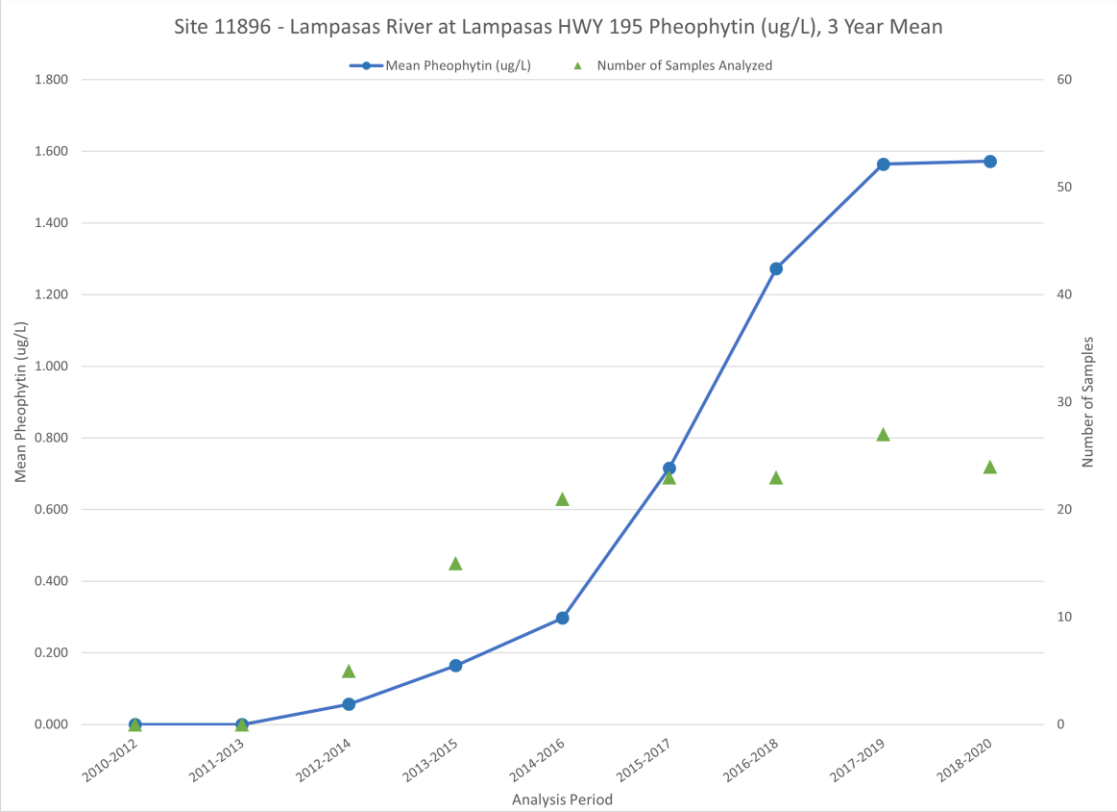
STATION 11896: LAMPASAS RIVER AT HWY 195

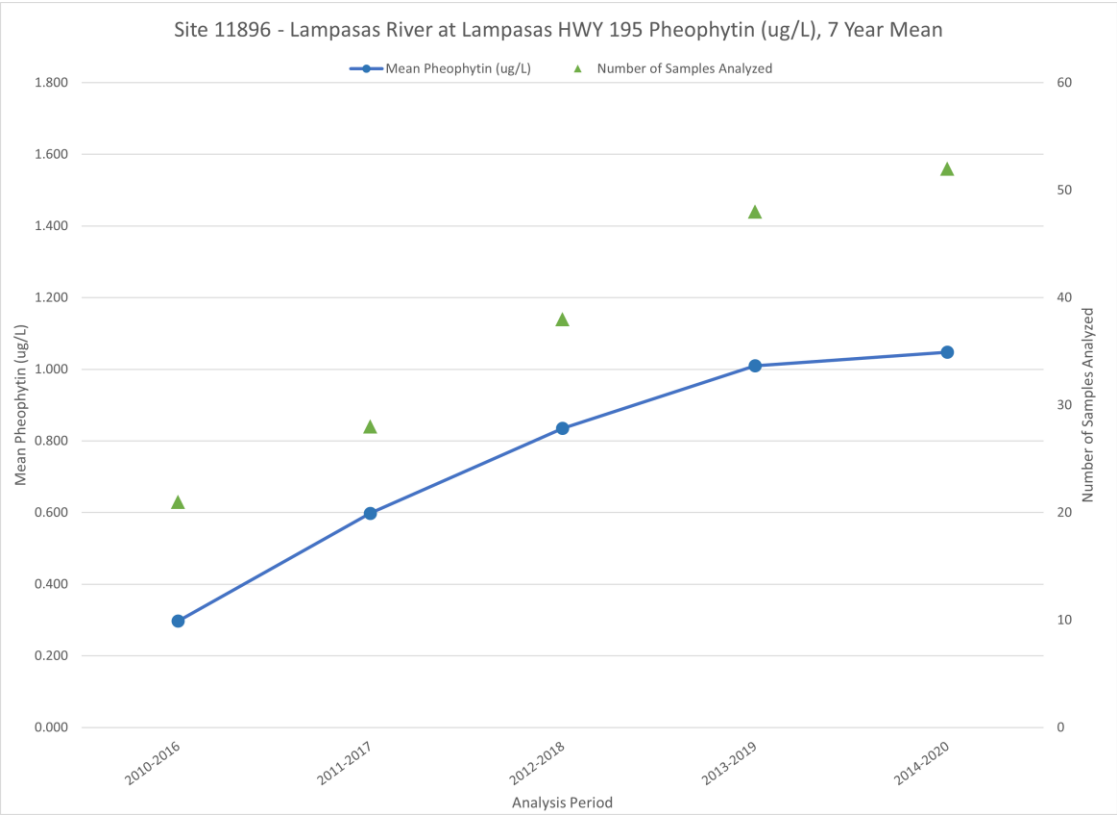


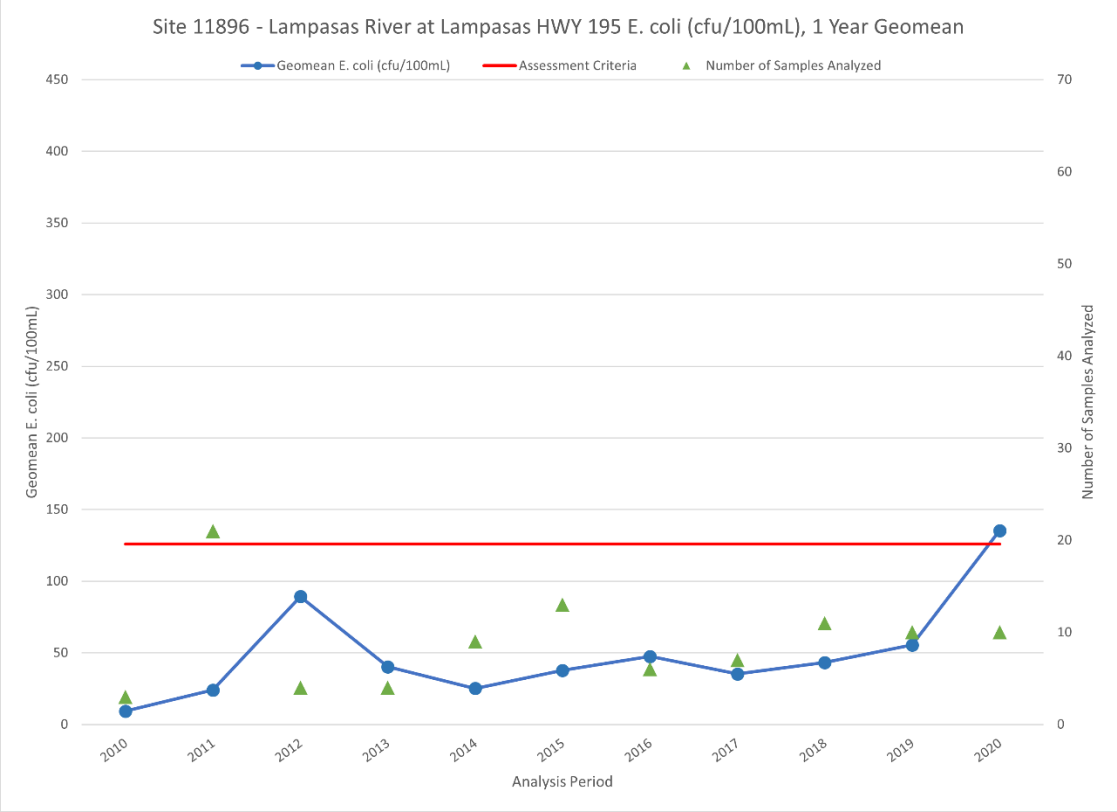


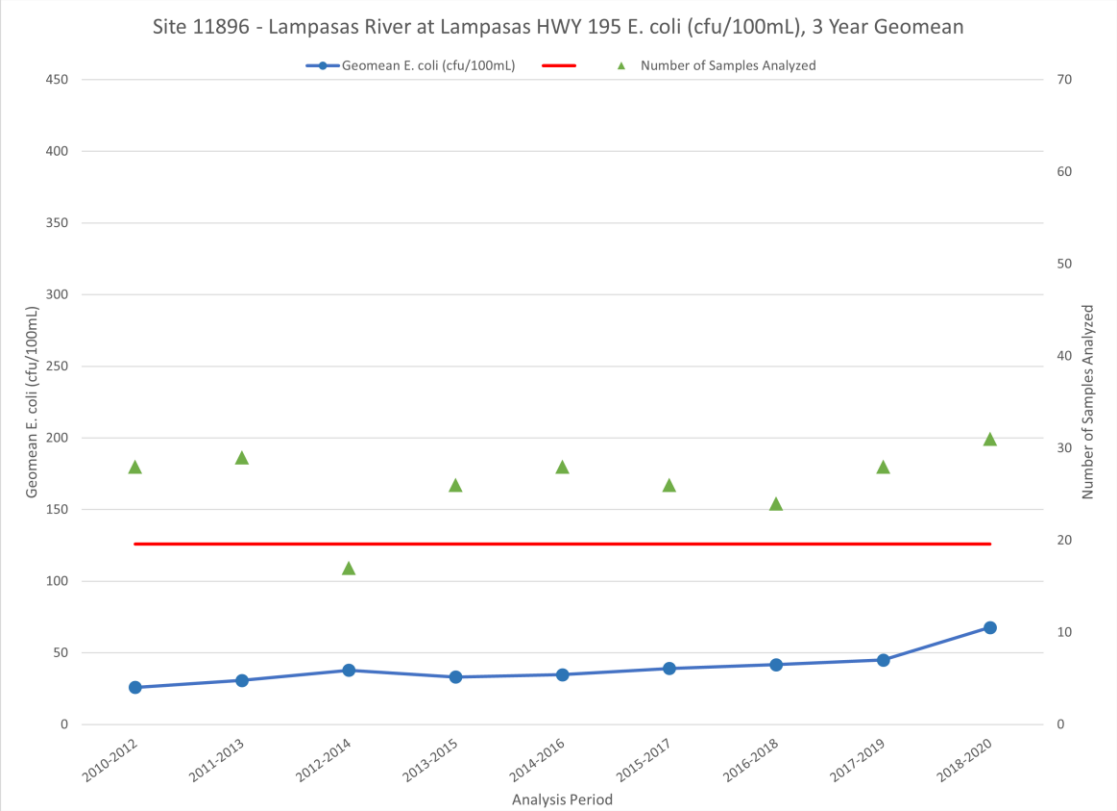

Site 11896 - Lampasas River at Lampasas HWY 195 Chlorophyll-a, (ug/L), 7 Year Mean
Mean Chlorophyll-a, (ug/L)
Screening Criteria
Number of Samples Analyzed
Mean Chlorophyll-a, (ug/L)
Number of Samples Analyzed
0
2
4
6
8
10
12
14
16
0
10
20
30
40
50
60
2010-2016
2011-2017
2012-2018
2013-2019
2014-2020
Analysis Period

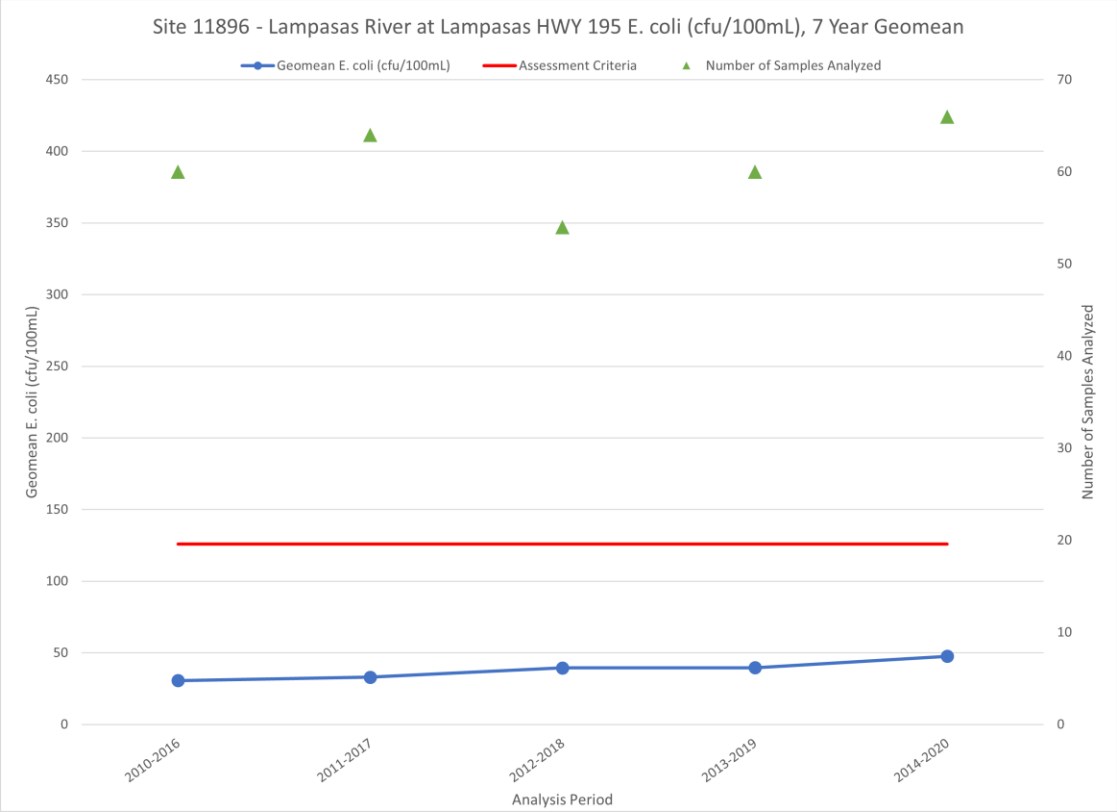

Site 11896 - Lampasas River at Lampasas HWY 195 Pheophytin (ug/L), 1 Year Mean
Mean Pheophytin (ug/L)
Number of Samples Analyzed
Mean Pheophytin (ug/L)
Number of Samples Analyzed
0.000
0.200
0.400
0.600
0.800
1.000
1.200
1.400
1.600
1.800
0
10
20
30
40
50
60
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Analysis Period

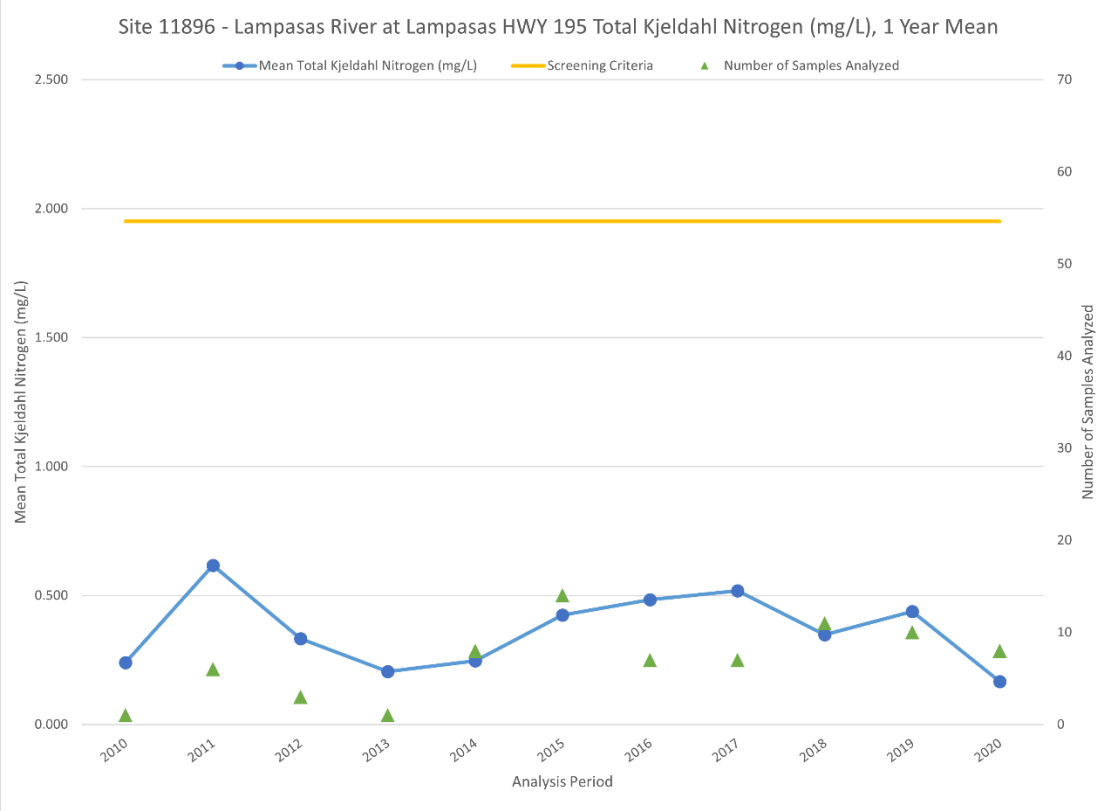

Site 11896 - Lampasas River at Lampasas HWY 195 Pheophytin (ug/L), 3 Year Mean
Mean Pheophytin (ug/L)
Number of Samples Analyzed
Mean Pheophytin (ug/L)
Number of Samples
1.800
1.600
1.400
1.200
1.000
0.800
0.600
0.400
0.200
0.000
60
50
40
30
20
10
0
2010-2012
2011-2013
2012-2014
2013-2015
2014-2016
2015-2017
2016-2018
2017-2019
2018-2020
Analysis Period

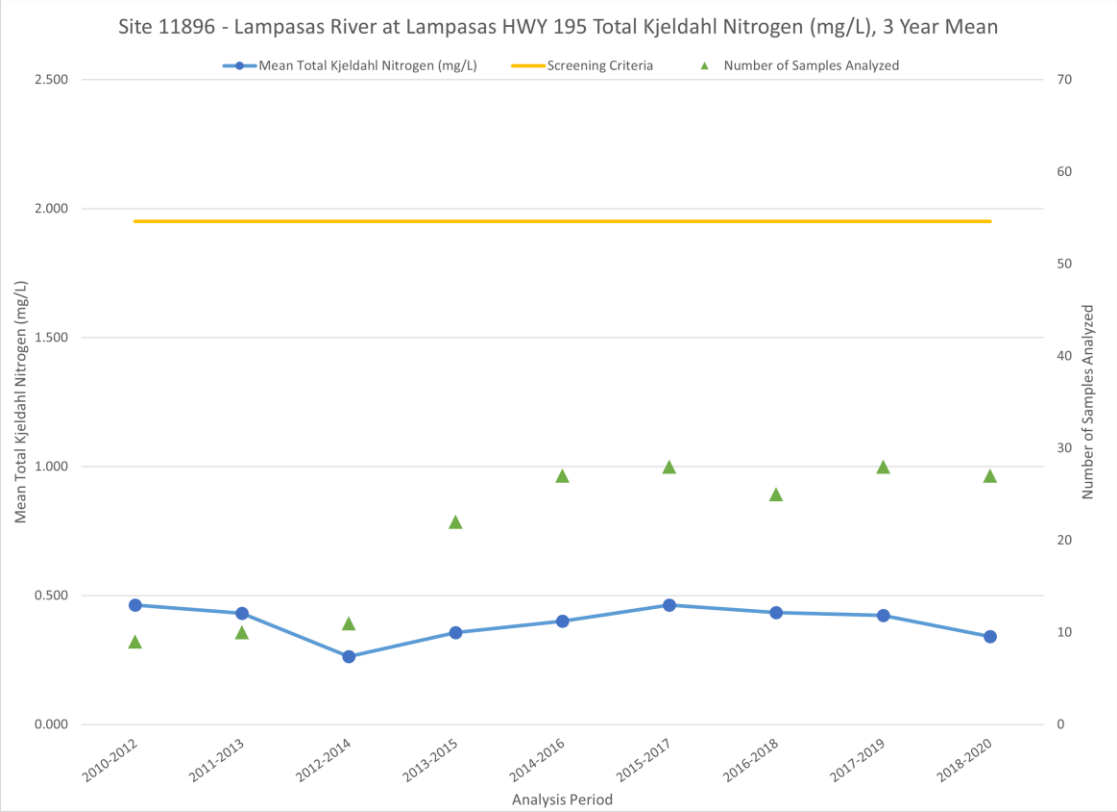

Site 11896 - Lampasas River at Lampasas HWY 195 Pheophytin (ug/L), 7 Year Mean
Mean Pheophytin (ug/L)
Number of Samples Analyzed
Mean Pheophytin (ug/L)
Number of Samples Analyzed
1.800
1.600
1.400
1.200
1.000
0.800
0.600
0.400
0.200
0.000
60
50
40
30
20
10
0
2010-2016
2011-2017
2012-2018
2013-2019
2014-2020
Analysis Period

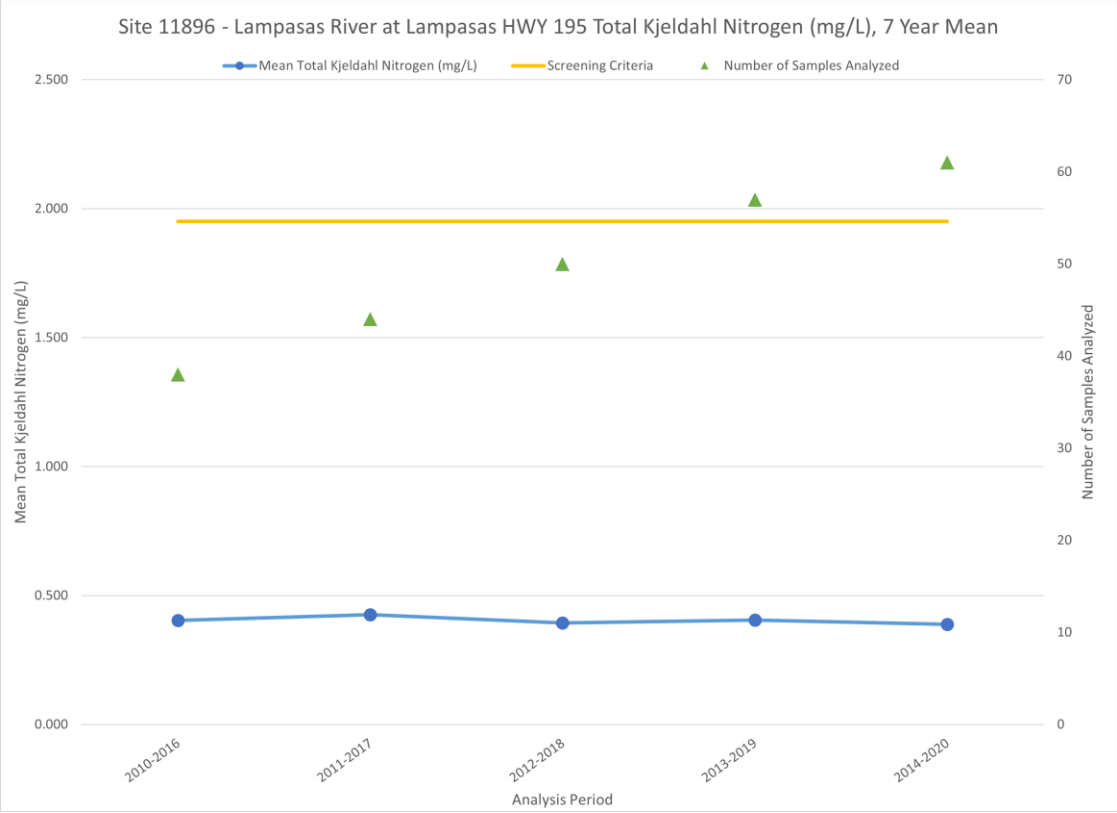

Site 11896 - Lampasas River at Lampasas HWY 195 E. coli (cfu/100mL), 1 Year Geomean
Geomean E. coli (cfu/100mL)
Assessment Criteria
Number of Samples Analyzed
Geomean E. coli (cfu/100mL)
Number of Samples Analyzed
Analysis Period
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

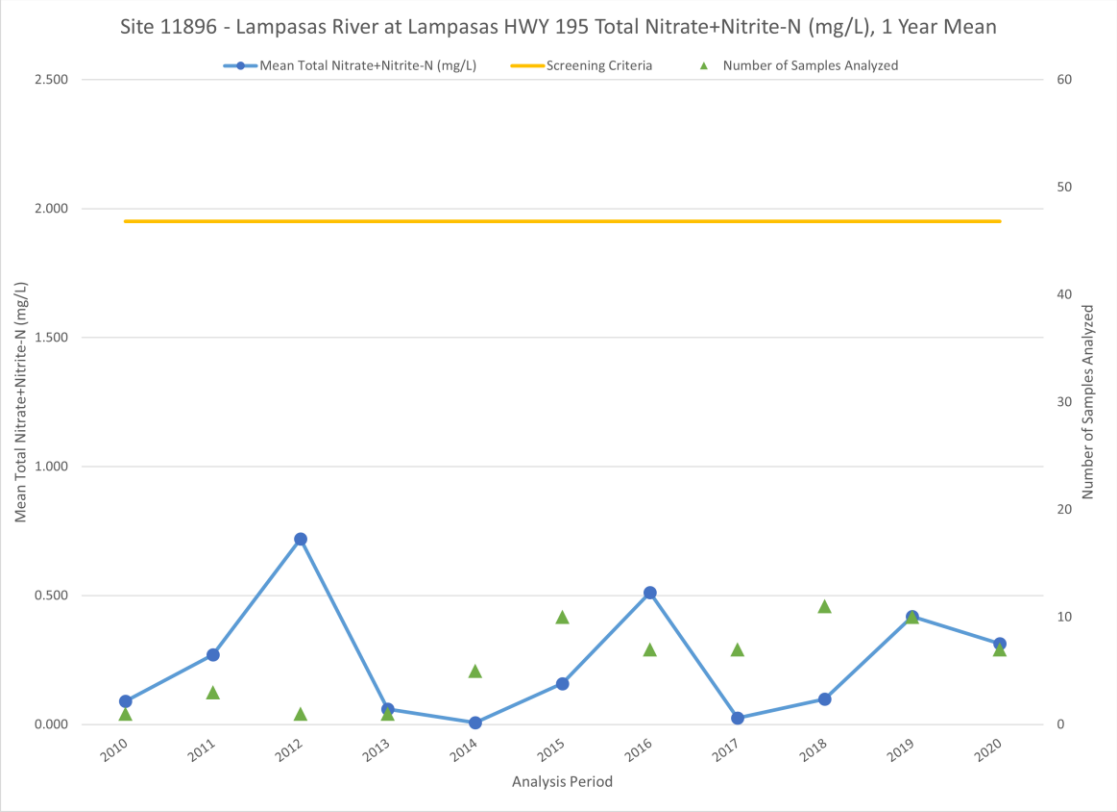

Site 11896 - Lampasas River at Lampasas HWY 195 E. coli (cfu/100mL), 3 Year Geomean
Geomean E. coli (cfu/100mL)
Number of Samples Analyzed
Geomean E. coli (cfu/100mL)
Number of Samples Analyzed
Analysis Period
2010-2012
2011-2013
2012-2014
2013-2015
2014-2016
2015-2017
2016-2018
2017-2019
2018-2020

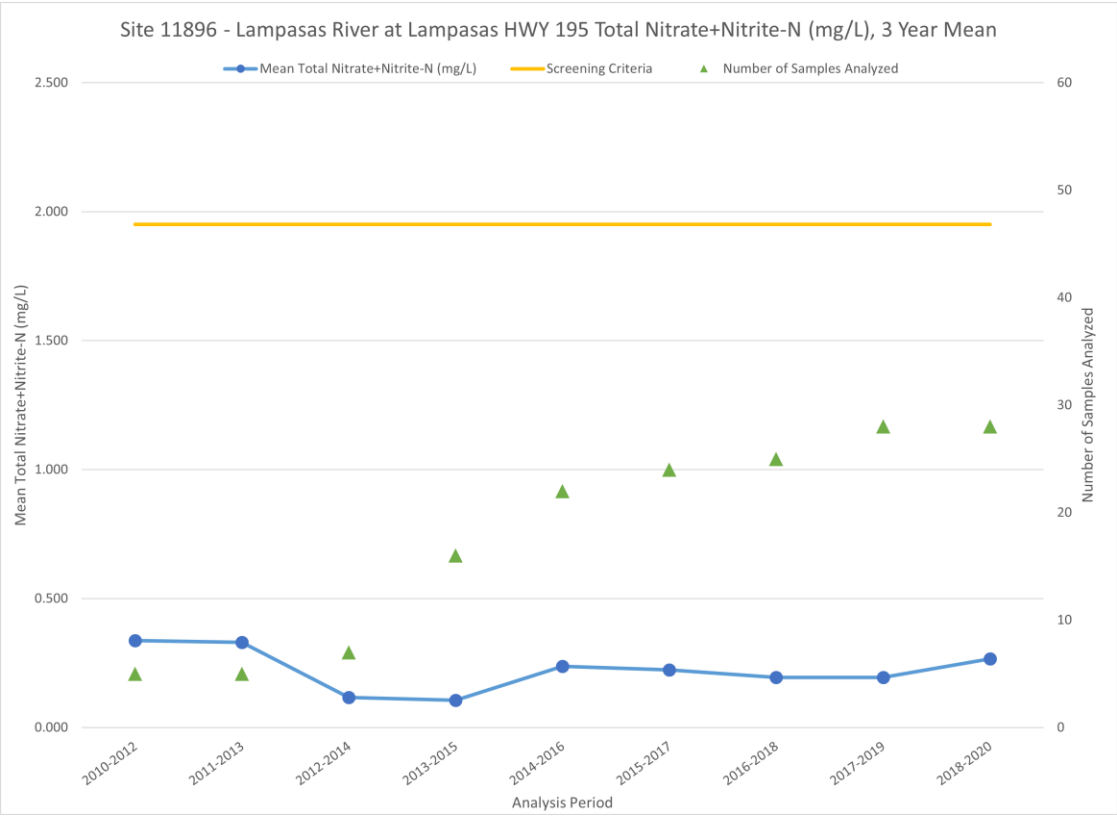

Site 11896 - Lampasas River at Lampasas HWY 195 E. coli (cfu/100mL), 7 Year Geomean
Geomean E. coli (cfu/100mL)
Assessment Criteria
Number of Samples Analyzed
Geomean E. coli (cfu/100mL)
Number of Samples Analyzed
Analysis Period
2010-2016
2011-2017
2012-2018
2013-2019
2014-2020

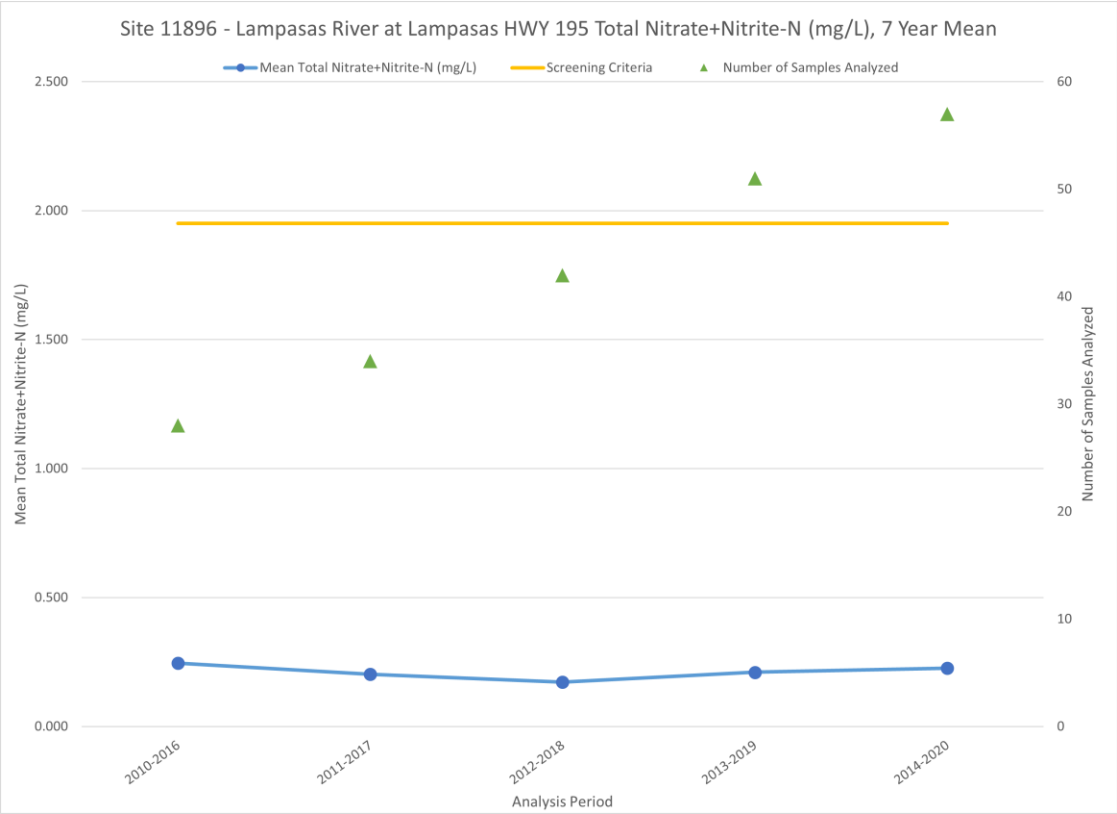

Site 11896 - Lampasas River at Lampasas HWY 195 Total Kjeldahl Nitrogen (mg/L), 1 Year Mean
Mean Total Kjeldahl Nitrogen (mg/L)
Screening Criteria
Number of Samples Analyzed
Mean Total Kjeldahl Nitrogen (mg/L)
Number of Samples Analyzed
Analysis Period


Site 11896 - Lampasas River at Lampasas HWY 195 Total Kjeldahl Nitrogen (mg/L), 3 Year Mean
Mean Total Kjeldahl Nitrogen (mg/L)
Screening Criteria
Number of Samples Analyzed
Mean Total Kjeldahl Nitrogen (mg/L)
Number of Samples Analyzed
2.500
2.000
1.500
1.000
0.500
0.000
70
60
50
40
30
20
10
0
2010-2012
2011-2013
2012-2014
2013-2015
2014-2016
2015-2017
2016-2018
2017-2019
2018-2020
Analysis Period


Site 11896 - Lampasas River at Lampasas HWY 195 Total Kjeldahl Nitrogen (mg/L), 7 Year Mean
Mean Total Kjeldahl Nitrogen (mg/L)
Screening Criteria
Number of Samples Analyzed
Mean Total Kjeldahl Nitrogen (mg/L)
Number of Samples Analyzed
2.500
2.000
1.500
1.000
0.500
0.000
70
60
50
40
30
20
10
0
2010-2016
2011-2017
2012-2018
2013-2019
2014-2020
Analysis Period


Site 11896 - Lampasas River at Lampasas HWY 195 Total Nitrate+Nitrite-N (mg/L), 1 Year Mean
Mean Total Nitrate+Nitrite-N (mg/L)
Screening Criteria
Number of Samples Analyzed
Mean Total Nitrate+Nitrite-N (mg/L)
Number of Samples Analyzed
2.500
2.000
1.500
1.000
0.500
0.000
60
50
40
30
20
10
0
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Analysis Period


Site 11896 - Lampasas River at Lampasas HWY 195 Total Nitrate+Nitrite-N (mg/L), 3 Year Mean
Mean Total Nitrate+Nitrite-N (mg/L)
Screening Criteria
Number of Samples Analyzed
Mean Total Nitrate+Nitrite-N (mg/L)
Number of Samples Analyzed
2.500
2.000
1.500
1.000
0.500
0.000
60
50
40
30
20
10
0
2010-2012
2011-2013
2012-2014
2013-2015
2014-2016
2015-2017
2016-2018
2017-2019
2018-2020
Analysis Period


Site 11896 - Lampasas River at Lampasas HWY 195 Total Nitrate+Nitrite-N (mg/L), 7 Year Mean
Mean Total Nitrate+Nitrite-N (mg/L)
Screening Criteria
Number of Samples Analyzed
2.500
2.000
1.500
1.000
0.500
0.000
60
50
40
30
20
10
0
Mean Total Nitrate+Nitrite-N (mg/L)
Number of Samples Analyzed
2010-2016
2011-2017
2012-2018
2013-2019
2014-2020
Analysis Period